EDF Nuclear Generation Limited (ENGL)

Decommissioning of Hunterston B Nuclear Power Station

EIA Scoping Report - Appendices

Wood Group UK Limited – August 2022

Contents

Appendix 1A.

List of competent experts

Appendix 1A
List of competent experts

Competent experts involved in the preparation of this Scoping Reportg are listed in the table below. The second column of this table includes two categories of staff, with different levels of responsibility:

a. Primary author

b. Secondary author

Aspect	Responsibility	Name of company	Qualifications/competencies of author
Introduction	Primary Author	Wood	BSc (Hons) in Geography, MSc in Integrated Environmental Studies, PIEMA, 6 years' experience in EIA.
Policy and Legislation	Primary Author	Wood	BSc (Hons) in Geography, MSc in Integrated Environmental Studies, PIEMA, 6 years' experience in EIA.
The Decommissioning Process	Primary Author	EDF Energy	MSc in Environmental Science, BSc in Environmental Science, PIEMA, 7 years' experience in EIA.
Approach to EIA	Primary Author	Wood	BSc (Hons) in Geography, MSc in Integrated Environmental Studies, PIEMA, 6 years' experience in EIA.
Air Quality	Primary Author	Wood	BSc (Hons) in Biology, MSc in Environmental Diagnostics, Full member of IAQM, Full member of IES, 16 years' experience in air quality consultancy.
Air Quality	Secondary Author	Wood	BSc in Chemistry, MSc in Climate Change and Environmental Policy (Merit), 2 years' experience in air quality consultancy.
Climate Change	Primary Author	Wood	BSc (Hons) in Biology, MSc in Environmental Diagnostics, Full member of IAQM, Full member of IES, 16 years' experience in air quality consultancy.
Climate Change	Secondary Author	Wood	BSc (Hons) in Geography, MSc in Risk, Practitioner member of IEMA, 4 years' experience in environmental consultancy.
Terrestrial Ecology	Primary Author	Wood	BSc (Hons) in Ecology, MRes in Ecology, Chartered Environmentalist with the Society for

Aspect	Responsibility	Name of company	Qualifications/competencies of author
			the Environment, Member of CIEEM, 20 years' experience of ecology consultancy.
Terrestrial Ecology	Secondary Author	Wood	BSc (Hons) in Ecology, MRes in Ecology, Chartered Environmentalist with the Society for the Environment, Member of CIEEM, 20 years' experience of ecology consultancy.
Marine Ecology	Primary Author	Wood	BSc in Zoology, Post-grad certificate in Management, Member of IFM, Member of FSBI, 30 years of aquatic ecological experience
Marine Ecology	Primary Author	Wood	BSc (Hons) in Marine and Freshwater Biology, Associate member of CIEEM, 4 years' experience in Marine Consultancy.
Coastal Management and Water Quality	Primary Author	Wood	BSc (Hons) in Chemistry, MSc in Ecology, Fellow of the CIWEM, Fellow of the Royal Society of Biology, 48 years' experience in water quality consultancy.
Coastal Management and Water Quality	Secondary Author	Wood	BSc (Hons) in Marine Biology & Oceanography, MSc in International Marine Environmental Consultancy, Associate Member of IMarEst, 5 years' experience in marine environmental consultancy.
Surface Water	Primary Author	Wood	BSc (Hons) in Geography, MSc in Water Resource System Engineering, PhD in Analysis of Spatial variability in Snow Processes, Chartered Scientist with the Science Council, Member of CIWEM, 16 years' experience in water consultancy.
Surface Water	Secondary Author	Wood	BSc (Hons) in Geography, MSc in Hydrology and Climate Change, Member of CIWEM, 9 years' experience in water consultancy.
Soils, Geology and Hydrogeology	Primary Author	Wood	BSc (Hons) in Plant Sciences, MSc in Environmental Rehabilitation, Professional Certificate in Management, Practitioner member of IEMA, Environmental auditor for IEMA, 26 years' experience in environmental consultancy.
Soils, Geology and Hydrogeology	Secondary Author	Wood	BSc (Hons) in Geology, MSc in Hydrogeology, fellow of the geological society and associate member of the society for radiological protection. 15 years' experience in environmental consultancy.
Historic Environment	Primary Author	Wood	BSc (Hons) in Ancient and Modern History, MA in Field Archaeology, PhD in Historical Archaeology, Member of CIA, 23 years'

Aspect	Responsibility	Name of company	Qualifications/competencies of author
			experience in historic environmental consultancy.
Historic Environment	Secondary Author	Wood	BSc (Hons) in Archaeology, MA in Field and Analytical Techniques in Archaeology, Associate member of CIFA, 22 years' experience in historic environmental consultancy.
LVIA	Primary Author	Wood	BA (Hons) in Landscape Architecture, 25 years' experience in LVIA consultancy
LVIA	Secondary Author		BA (Hons) in Landscape Architecture, PG Dip in Landscape Architecture, Chartered Member of Landscape Institute, 19 years' experience in LVIA consultancy.
Noise and Vibration	Primary Author	Wood	BSc (Hons) in Acoustics, HND in Sound Engineering & Multimedia Integration, Corporate member of IOA, 10 years' experience in acoustics consultancy.
Noise and Vibration	Secondary Author	Wood	BSc in Physics, MSc in Environmental Acoustics, Professional member of IOA, 4 years' experience in acoustics consultancy.
Traffic and Transport	Primary Author	Wood	BA in Geography/Planning, 18 years' experience in transportation planning.
Traffic and Transport	Secondary Author	Wood	Diploma in Planning, BA (Hons) in Planning Studies, MSc in Transport Engineering and Operations, Member of RTPI, 28 years' experience in transport planning.
Socio-Economics	Primary Author	Wood	BA in Engineering, MA in Engineering, 25 years' experience in socio-economic consultancy.
Major Accidents and Disasters	Primary Author	Wood	BSc (Hons) in Chemistry, Chartered Member of RSC, 25 years' experience working with major hazards.
Major Accidents and Disasters	Secondary Author	Wood	MChem BSc (Hons) in Chemistry, Member of RSC, Registered Scientist with The Science Council, Chartered Environmentalist (CEnv), Chartered Chemist (CChem), 9 years' experience working with major hazards.
Conventional Waste	Primary Author	Wood	BSc (Hons) in Town and Regional Planning, member of RTPI, Affiliate of IoQ, 27 years' experience in waste management consultancy.
Conventional Waste	Secondary Author	Wood	BSc (Hons) in Environmental Studies, Post-Graduate Diploma in Environmental Rehabilitation, Corporate member of CIWM, 26

Aspect	Responsibility	Name of company	Qualifications/competencies of author
			years' experience in waste management consultancy.

Appendix 1B.

Glossary of terms and abbreviations

Appendix 1B
Glossary of terms and abbreviations

Abbreviations

Term/abbreviation	Definition
AA	Annual Average
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
AEP	Annual Exceedance Probability
AETP	Active Effluent Treatment Plant
AGL	Above ground level
AGR	Advanced Gas Cooled Reactor
ALARP	As low as reasonably practicable
AOD	Above Ordnance datum
APC	Area of Potential Concern
APIS	Air Pollution Information System
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Standard
ATC	Automatic Traffic Count
AWI	Ancient Woodland Inventory
BEIS	Department for Business, Energy and Industrial Strategy
BNFL	British Nuclear Fuels Limited
BNL	Basic Noise Level
BoCC	Birds of Conservation Concern
BPM	Best Practicable Means
BTO	British Trust for Ornithology

Term/abbreviation	Definition
CAFS2	Cleaner Air for Scotland 2
CAR	Water Environment (Controlled Activity) (Scotland) Regulations 2011
CCA	Coastal Character Area
CCC	Climate Change Committee
CCR	Climate Change Resilience
CDM	Construction Design and Management
CDOIF	Chemical and Downstream Oil Industries Forum
CEA	Cumulative Effects Assessment
CEH	Centre of Ecology and Hydrology
CH_4	Methane
CIBSE	Chartered Institution of Building Services Engineers
CIEEM	Chartered Institute of Ecology and Environmental Management
CMPP	Clyde Marine Planning Partnership
CO	Carbon Monoxide
COMAH	Control of Major Accident Hazards
CoP	Code of practice
COPA	Control of Pollution Act
CRTN	Calculation of Road Traffic Noise
CSZ	Core Sustenance Zones
C_6H_6	Benzene
DEPZ	Detailed Emergency Planning Zone
DETR	Department for the Environment, Transport and Regions
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DoWCoP	Definition of Waste Code of Practice
DWPF	Decommissioning Waste Processing Facility
DTM	Digital Terrain Model
EC	European Commission

Term/abbreviation	Definition
EcIA	Ecological Impact Assessment
EEA	European Economic Area
EFT	Emission Factor Toolkit
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EIADR	Environmental Impact Assessment for Decommissioning Regulations
ELC	European Landscape Convention
eMARS	European Commission Major Accident Reporting System
EMP	Environment Management Plan
EPA	Environmental Protection Act
EPS	European Protected Species
EQS	Environmental Quality Standard
ES	Environmental Statement
ESCCS	Environmental Sustainability & Climate Change Strategy
ETS	Emissions Trading Scheme
EU	European Union
FEH	Flood Estimation Handbook
FRA	Flood Risk Assessment
FSC	Final Site Clearance
GBq/te	Gigabecquerels per tonne
GEART	Guidelines for the Environmental Assessment of Road Traffic
GES	Good Environmental Status
GHG	Greenhouse Gases
GLVIA3	Third edition of the Guidelines for Landscape and Visual Impact Assessment
GPP	Guidance for Pollution Prevention
HADV	Higher Activity Debris Vault
HAW	Higher Activity Waste
HEP	Historic Environment Policy

Term/abbreviation	Definition
HFC	Hydrofluorocarbon
HGV	Heavy Goods Vehicle
HLW	High Level Waste
HNA	Hunterston A Nuclear Power Station
HNB	Hunterston B Nuclear Power Station
HRA	Habitats Regulations Assessment
HSAW	Health and Safety at Work
HSC	Hazardous Substances Consent
HSE	Health and Safety Executive
IAQM	Institute of Air Quality Management
ICE	Inventory of Carbon and Energy
ICCI	In-combination Climate Change Impact
ICILWS	Interim Conditioned Intermediate Level Waste Store
IEA	Institute of Environmental Assessment
IEEM	Institute of Ecology and Environmental Management
IEMA	Institute of Environmental Management and Assessment
ILMP	Integrated Land Management Plan
ILW	Intermediate Level Waste
INNS	Invasive and Non-Native Species
IPCC	Intergovernmental Panel on Climate Change
IRR	Ionising Radiations Regulations
IWS	Integrated waste strategy
KPI	Key Performance Indicator
LAQM	Local Air Quality Management
LCRM	Land Contamination Risk Management
LCT	Landscape Character Type
LDP	Local Development Plan
LLW	Low Level Waste

Term/abbreviation	Definition
LMAR	Land Management Annual Review
LNCS	Local Nature Conservation Sites
LOAEL	Lowest Observed Adverse Effect Level
LPD	Local Plan District
LQM	Land Quality Management
LSE	Likely Significant Effects
LT	Long-term
LVIA	Landscape and Visual Impact Assessment
LWS	Listed Wildlife Site
MAC	Maximum allowable concentration
MAHP	Major Accident Hazard Pipeline
MAPP	Major Accident Prevention Policy
MHWS	Mean High Water Springs
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
MS-LOT	Marine Scotland Licensing Operations Team
MtCO2e	Mega tonnes carbon dioxide equivalent
NAC	North Ayrshire Council
NCR	National Cycle Route
NDA	Nuclear Decommissioning Authority
NDC	Nationally Determined Contribution
NERC	Natural Environment Research Council
NGR	National Grid Reference
NIA	Nuclear Installations Act
NLF	Nuclear Liabilities Fund
NNR	National Nature Reserve
NO_x	Oxides of Nitrogen
NO_2	Nitrogen Dioxide

Term/abbreviation	Definition
NPF	National Planning Framework
NRMM	Non-Road Mobile Machinery
NRW	Natural Resources Wales
NSL	Nuclear Site Licence
NSR	Noise Sensitive Receptor
NTEM	National Trip End Model
N_2O	Nitrous Oxide
OEPZ	Outer Emergency Planning Zone
ONR	Office for Nuclear Regulation
ONS	Office of National Statistics
OS	Ordnance Survey
OWPF	Operational Waste Processing Facility
PAH	Polycyclic aromatic hydrocarbons
PAN	Planning Advice Note
Pb	Lead
PC	Process Contribution
PFC	Perfluorocarbon
PIA	Personal injury accident
PMF	Priority Marine Feature
$PM_{2.5}$	Particulate Matter smaller than 2.5µm
PM_{10}	Particulate Matter smaller than 10µm
PPC	Pollution Prevention and Control
PPE	Personal Protective Equipment
PfQ	Preparations for Quiescence
pSAC	Possible Special Area of Conservation
pSPA	Potential Special Protection Area
PWPT	Potable water treatment plant
PWS	Private Water Supply

Term/abbreviation	Definition
RBMP	River Basin Management Plan
REPPIR	Radiation (Emergency Preparedness and Public Information) Regulations
RIBA	Royal Institute of British Architects
RICS	Royal Institute of Chartered Surveyors
RSPB	Royal Society for the Protection of Birds
RWMP	Radioactive waste management cases
R2P2	Reducing Risks, Protecting People
SAP	Safety Assessment Principle
SBL	Scottish Biodiversity List
SCI	Sites of Community Importance
SEPA	Scottish Environmental Protection Agency
SFRA	Strategic Flood Risk Assessment
SF_6	Sulphurhexafluoride
SLA	Special Landscape Area
SMP	Shoreline Management Plan
SNH	Scottish Natural Heritage
SO_2	Sulphur Dioxide
SPA	Special Protection Area
SPP	Scottish Planning Policy
SPRI	Scottish Pollution Return Inventory
SPZ	Source Protection Zone
SRAM	Safety Report Assessment Manual
SSAFO	Silage, Slurry and Agricultural Fuel Oil
SSSI	Site of Special Scientific Interest
ST	Short-term
SWSEIC	South West Scotland Environmental Information Centre
TAN	Technical Advice Note
TPH	Total petroleum hydrocarbons

Term/abbreviation	Definition
UKAEA	United Kingdom Atomic Energy Authority
UKCP	UK Climate Projections
UKRWI	UK Radioactive Waste Inventory
UNFCC	United Nations Framework Convention on Climate Change
UST	Underground Storage Tank
VLLW	Very Low Level Waste
WeBS	Wetland Bird Survey
WeWS Act	The Water Environment and Water Services (Scotland) Act
WFD	Water Framework Directive
WHVDC	Western High Voltage Direct Current
WLA	Wild Land Area
WMC	Waste Management Centre
WPA	Waste Planning Authority
WoSAS HER	West of Scotland Archaeology Service Historic Environment Record
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

Glossary

Term	Definition
Abnormal indivisible loads (AILs)	Large loads which by their nature cannot be broken into smaller multiple deliveries.
Above Ordnance Datum (AOD)	An Ordnance Datum or OD is a vertical datum used by an ordnance survey as the basis for deriving altitudes on maps. A spot height may be expressed as AOD for "Above Ordnance Datum". Usually mean sea level is used for the datum.
Additional Measures	Further measures required in order to achieve the anticipated outcome. These are referred to as 'secondary measures' in accordance with IEMA guidelines.
Agricultural Land Classification (ALC)	A classification of agricultural land in England and Wales according to its quality and agricultural versatility. The classifications range from Grade 1 (the best and most versatile) through Grades 2, 3a, 3b, 4, down to 5 (the least versatile).
Annex I Habitats	Habitats listed in Annex I of the Habitats Directive 92/43/EEC.
Appropriate Assessment (AA)	A process required by the Habitats Directive 92/43/EEC to avoid adverse effects of plans, programmed and projects on Natura 2000 sites and thereby maintain the integrity of the Natura 2000 network and its features.
As Low As Reasonably Practicable (ALARP)	To satisfy this principle, measures necessary to reduce risk must be taken until the cost of these measures whether in money, time or trouble, is disproportionate to the reduction of risk. (Edwards v National Coal Board [1949]).
Baseline	The situation prevailing before the Proposed Works are commenced (the current baseline), and also to the situation that would prevail in the future without the Proposed Works (the future baseline).
Bathymetry	Describes the 'topography' or profile of the seabed.
Best Available Technique (BAT)	BAT is defined as the most effective and advanced stage in the development of activities and their methods of operation, which indicates the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and impact on the environment as a whole.
Brownfield Land	Land that has been previously developed is known as Brownfield land.
Conservation Areas	Designated areas of special architectural or historic interest, the character or appearance of which is desirable to preserve or enhance which have protection under legislation.
Carbon Budget	A restriction on the total amount of greenhouse gases the UK can emit over a 5-year period.
CO_2 Equivalent (CO_{2eq})	A metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.
Decarbonisation	The process of reducing the amount of greenhouse gas emissions made.
Disaster	A natural occurrence that is reasonably foreseeable and leads to serious damage on receptors, either immediate or delayed.

Term	Definition
Environmental Impact Assessment (EIA)	An EIA is a tool for systematically examining and assessing the impacts and effects of a development on the environment. The objective of the EIA is to identify any likely significant effects which may arise from the Proposed Works and identify measures to prevent, reduce or offset any adverse effects.
Environmental Statement	The outcome of the EIA process is reported within a document called an Environmental Statement.
Final Site Clearance	Final Site Clearance (FSC) involving the deconstruction of the safestore and final decommissioning is estimated to last approximately 12 years in duration and will commence up to 85 years after end of generation.
Future Baseline	This is the theoretical situation that would exist in the absence of the Proposed Works. This is based upon extrapolating the current baseline using technical knowledge of likely changes over the identified period (for example anticipated habitat change over time, climate change projections, traffic and waste volume growth over time, etc.).
Good Practice Measures	Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements or actions that are considered to be standard practice used to manage commonly occurring environmental effects. These are referred to as 'tertiary measures' in accordance with the IEMA guidelines and would also be embedded within the design of the Proposed Works.
Groundwater	Water occurring below ground in natural formations (typically rocks, gravels and sands).
Hazard	Hazard is the potential for harm arising from an intrinsic property or ability of something to cause detriment.
Hazardous Waste	Hazardous waste is essentially waste that contains hazardous properties that may render it harmful to human health or the environment. The European Commission has issued a Directive on the controlled management of such waste (91/689/EEC) and hazardous waste is defined on the basis of a list drawn up under that Directive. Examples include asbestos, lead-acid batteries, oils and solvents.
Higher Activity Waste (HAW)	Higher activity radioactive waste comprises a number of categories of radioactive waste – High Level Waste (HLW), Intermediate Level Waste (ILW), and Low Level Waste (LLW) that is not suitable for near-surface disposal in current facilities.
In-combination Effects	In-combination effects are effects that occur as a result of two or more project impacts acting together (i.e.) combined, to result in a new or changed effect on a specific receptor.
Intertidal	The area of shore between the highest and lowest tides.
Intermediate Level Waste (ILW)	Waste with radioactivity levels exceeding the upper boundaries for Low Level Waste (LLW), but which does not need heating to be taken into account in the design of storage or disposal facilities. ILW arises mainly from the reprocessing of spent fuel, and from general operations and maintenance of radioactive plant. The major components of ILW are metals and organic materials, with smaller quantities of cement, graphite, glass and ceramics.
Intolerable Risk	Above a certain level, a risk is regarded as intolerable and cannot be justified in any ordinary circumstance.

Term	Definition
Listed Buildings	Buildings and structures which have been identified as being of special architectural or historic interest and whose protection and maintenance are the subject of special legislation.
Low Level Waste (LLW)	Low Level Waste which includes metals, soil, building rubble and organic materials, arising principally as lightly contaminated miscellaneous scrap. Wastes other than those suitable for disposal with ordinary refuse, but not exceeding 4 GBq/tonne (gigabecquerels) of alpha or 12 GBq/tonne of beta/gamma activity. Metals are mostly in the form of redundant equipment. Organic materials are mainly in the form of paper towels, clothing and laboratory equipment that have been used in areas where radioactive materials are used e.g. hospitals, research establishments and industry.
Major Accident	A reasonably foreseeable but unintended event caused by a man-made activity or asset that leads to serious damage on receptors, either immediate or delayed. The activity causing the event may be either within the project, or external to it.
Marine Environment	Anything below mean high water springs.
Nuclear Site Licence	A formal notification of the authorised body which can operate a nuclear operation under the Nuclear Installations Act (1965).
Oslo-Paris Conventions (OSPAR)	Oslo-Paris Conventions which established requirements on the level of nuclear and non-nuclear discharges to the marine environment of the North East Atlantic, the North Sea and the Irish Sea.
Pre-application Opinion	Informs the requirements of EIA process and ultimately the Environmental Statement (ES) which will be submitted as part of the application. Through the scoping process the views of the statutory consultees and other relevant organisations on the proposed scope of the EIA are sought.
Preparations for Quiescence Phase	Preparations for Quiescence Phase is the first phase of decommissioning and is expected to take up to 12 years after the End of Generation at the Site. The purpose of this phase is to reduce the hazard presented by the radioactive and non-radioactive materials and wastes on the site, and to make preparations to place the site into a passively safe and secure state
Receptor	A built asset, population or environmental aspect that may experience a change in its baseline condition as a result of an activity or impact pathway.
Quiescence Phase	The Quiescence phase will commence approximately 12 years after End of Generation, with the site remaining in this passive condition for approximately 70 years under a regime of continuous monitoring and surveillance, with periodic care and maintenance.
Scheduled Monument	A feature of national, historical or archaeological importance, either above or below the ground. Not all nationally important archaeological remains are scheduled and sites of lesser importance may still merit protection.
Serious Damage on the Environment	Loss or significant detriment to populations of species or organisms, valued sites (including designated sites), valued cultural heritage sites, contamination of drinking water supplies, ground or groundwater, or harm to environmental receptors.
Serious Damage to Human Populations	This includes harm which would be considered substantial i.e., death(s), multiple serious injuries or a substantial number requiring medical attention.

Term	Definition
Site of Special Scientific Interest (SSSI)	An area designated as being of special interest by reason of any of its flora, fauna or geological or physiographical features.
Special Area of Conservation	A site designated via the European Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) (i.e. the Habitats Directive) to protect rare and endangered habitats and species at a European level.
Special Protection Area	Designated under Article 4 of the European Directive on the Conservation of Wild Birds (2009/147/EC) (i.e. the Birds Directive) to protect the habitats of threatened and migratory birds.
Strategic Road Network	The strategic road network (or SRN) is made up of motorways and trunk roads (the most significant 'A' roads).
Subtidal	Areas below water at all states of tide.
Waste Hierarchy	A hierarchical approach to minimise the amounts of waste requiring disposal. The hierarchy consists of non-creation where practicable; minimisation of arisings where the creation of waste is unavoidable; recycling and reuse; and, only then, disposal.
Zone of Influence (ZoI)	An identified geographical area around the Proposed Works where there is a potential for impacts to occur.
Zone of Theoretical Visibility (ZTV)	The likely (or theoretical) extent of visibility of a development, usually shown on a map.

Appendix 4A.

Cumulative Effects Assessment – Other Development

Appendix 4A
Cumulative Effects Assessment – Other Development

Table 4A.1 contains the list of proposed 'other development' which will be taken into consideration as part of the Cumulative Effects Assessment for the Proposed Works.

The Applicant will engage with Magnox Ltd with respect to future development at Hunterston A (HNA). Should any planning applications at HNA come forward prior to the submission of the Environmental Statement, due regard will be given to them in the assessment.

Table 4A1 Proposed list of 'other development'

ID	Council	Application Reference	Address/Post code	National Grid Reference	Description of development
1	North Ayrshire	22/00209/EIA	Site to the north of Lawhill Farmhouse West Kilbride North Ayrshire	NS 21925 48255	EIA Scoping Opinion request for 49.9MW Solar Farm Development.
2	North Ayrshire	22/00133/PPPM	Former Coal Terminal Hunterston West Kilbride Ayrshire	NS 20155 53275	Planning permission in principle for the erection of a high voltage cable manufacturing facility, including detailed planning permission for the construction of a 185m high extrusion tower with associated factories, research and testing laboratories, offices with associated stores, transport, access, parking and landscaping with on-site generation and electrical infrastructure and cable delivery system.
3	North Ayrshire	21/01174/PPM	Site to the north of Summerlea Road and west of Snowdon Terrace Seamill West Kilbride Ayrshire	NS 19759 48256	Erection of 220 dwelling houses and associated infrastructure and landscaping
4	North Ayrshire	21/00109/EIA	Hunterston Construction Yard Fairlie Largs Ayrshire	NS 18625 53053	Request for EIA Screening Opinion in relation to the replacement and enlargement of existing jetty at Hunterston Marine Yard.
5	North Ayrshire	21/00107/EIA	Hunterston Construction Yard Fairlie Largs Ayrshire	NS 18625 53053	Request for EIA screening opinion for the renewal of planning permission 18/00132/PP for the erection of Caisson gates and removal of existing bund.

ID	Council	Application Reference	Address/Post code	National Grid Reference	Description of development
6	North Ayrshire	21/00622/EIA	Hunterston Construction Yard Fairlie Largs Ayrshire	NS 18625 53053	EIA Screening Request for a proposed 49.9MW cryogenic energy storage facility.
7	North Ayrshire	21/00480/EIA	Former Coal Terminal Hunterston West Kilbride Ayrshire	NS 19820 52384	EIA screening request for proposed synchronous compensator.
8	North Ayrshire	21/00160/EIA	Millport Flood Works Stuart Street Millport Ayrshire	NS 16039 54785	Request for EIA Screening Opinion for proposed Flood Alleviation Scheme in Millport.
9	North Ayrshire	20/00213/EIA	Ardrossan Harbour Montgomerie Street Ardrossan Ayrshire KA22 8LY	NS 22955 42391	Request for EIA Screening Opinion for liquid natural gas bunkering facility for the Ardrossan to Arran Ferry Service.
10	North Ayrshire	19/00087/EIA	Site to West of Hawk Craig Millport Isle of Cumbrae		Request for EIA screening opinion for proposed fish farm.
11	North Ayrshire	19/00086/EIA	Site to north-east of University Marine Biological Station Marine Parade Millport Isle of Cumbrae	NS 17734 54787	Request for EIA screening opinion for proposed fish farm.
12	Argyll and Bute Council	17/02586/MIN	Kingarth Quarry Kingarth Isle of Bute Argyll and Bute	NS 09560 56044	Continuation of winning and working of sand and gravel and infill operations including proposed extension area.
13	Argyll and Bute Council	18/01228/PNELEC	Land At Bruchag Kingarth Isle of Bute Argyll And Bute	NS 11526 57291	Proposed 11KV overhead line and underground cable works.
14	North Ayrshire	20/00386/LUE	Largs Academy and Kelburn Primary School Flatt Road Largs Ayrshire	NS 20820 59477	Erection of 122 dwellings including sheltered, supported, amenity, wheelchair and general needs: associated energy centre building, housing a biomass district heating system providing heating and hot water. The sheltered housing block includes associated common rooms and ancillary spaces. The supported accommodation unit has a staff office/ base which allows 24-hour care to be provided for those living within the block. The site was also compromise roads, parking and landscaping.

Appendix 5A.

Air Quality Objectives in Scotland

Appendix 5A
Air Quality Objectives in Scotland

Table 5A.1 provides the Air Quality Standards (AQS) and Air Quality Objectives (AQOs) relevant to Air Quality Assessments For NO_2, PM_{10} and $PM_{2.5}$. Currently these are the air pollutants of principal concern with respect to human health in Scotland.

Table 5A.1 Relevant Air Quality Standards and Objectives

Pollutant	Averaging period	Value ($\mu g\,m^{-3}$)
NO_2	Annual mean	40
NO_2	1 hour mean, not to be exceeded more than 18 times a year (equivalent to 99.79th percentile)	200
PM_{10}	Annual mean	18
PM_{10}	24 hours mean, not to be exceeded more than 7 times a year	50
$PM_{2.5}$	Annual mean	10

Guidance from Defra in LAQM.TG16[1] establishes that exceedances of the human health-based AQOs should only be assessed at outdoor locations where members of the general public are regularly present over the averaging time of the objective.

Table 5A.2 provides examples of those locations that may be relevant for different averaging periods, as extracted from LAQM.TG16[1].

Table 5A.2 Examples of locations where AQOs apply

Averaging period	Objectives should apply	Objectives should not apply
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.

[1] Defra (2018). Local Air Quality Management Technical Guidance (TG16) (Online) Available at: https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf (Accessed March 2022).

Averaging period	Objectives should apply	Objectives should not apply
24-hour mean, and 8-hour mean	All locations where the annual mean objectives would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1-hour mean	All locations where the annual mean and: 24 and 8-hour mean objectives would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where the public might reasonably be expected to spend one hour or more. Any outdoor locations at which the public may be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be expected to spend a period of 15 minutes or longer.	-

For NO_2, it is the annual mean objective that is the more stringent AQO. Monitoring results show that the 1-hour mean NO2 AQO is unlikely to be exceeded if the annual mean objective is not exceeded. For PM10, the 24-hour mean objective is more stringent than the annual mean.

The likelihood of exceedance of the NO2 and PM10 short-term AQOs can be assessed with reference to the predicted annual means and the relationships recommended by the Local Air Quality Management Technical Guidance (LAQM.TG(16))[1]. The 1-hour mean NO_2 objective is unlikely to be exceeded if the annual mean is less than 60 μgm^{-3}. An estimate of potential exceedances of the 24-hour mean PM_{10} objective is given by:

$$Number\ of\ 24\ hour\ mean\ exceedences = -18.5 + 0.00145\ x\ annual\ mean^3 + \frac{206}{annual\ mean}$$

On the basis of the above relationship, the 24-hour mean objective for PM10 is likely to be met if the predicted annual-mean PM10 concentration is 31.8 µgm-3 or less.

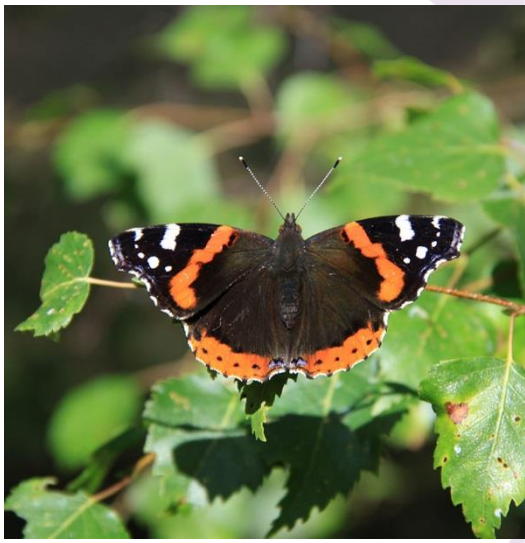
Appendix 7A.

Baseline Report: Desk Study (Terrestrial Ecology)

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Desk Study (Terrestrial Ecology)



Wood Environment & Infrastructure Solutions UK Limited – April 2020

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Document revisions

No.	Details	Date
1	Draft for client Review	October 2019
2	Final	December 2019
3	Final Report	April 2020

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy proposes to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B (HNB) to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under Town and Country Planning (Scotland) Act 1997 (TCPA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999, as amended, and EURATOM Article 37 (or an equivalent).

The current strategy is for an EIA to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the desk-based study of terrestrial ecology undertaken to inform the Environmental Impact Assessment (EIA) of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the terrestrial ecology desk study methods, results and conclusions. A separate desk study has been prepared for ornithology (*Hunterston B Decommissioning EIA – Baseline Report: Birds*). Sensitive information pertaining to the location of badger setts is provided separately in a Confidential Report (*Hunterston B Decommissioning EIA - Baseline Report: Badger*).

1.2 Scheme description

Decommissioning at HNB is expected to commence in 2023. The site location is shown on **Figure 1.1, Appendix A**. Once the necessary consent is in place, the decommissioning process ('the Project') would commence with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over a period of approximately 15 years, there will be a process of safe storage and management of intermediate and low-level waste, with intermediate-level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure - a clad, steel-framed structure based around the Reactor Building - will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance – will involve ongoing site/station care and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance, involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the site will operate similar to a conventional construction/demolition site.

1.3 Site Context

The HNB Station ('the Site' or 'the Station') is in North Ayrshire, approximately 9km south of Largs and 4km north-west of West Kilbride, on the Firth of Clyde coast. The approximate centre of the Site is situated at Ordnance Survey (OS) Grid Reference NS 18400 51400, and the Nuclear Site Licence (NSL) boundary extends

to approximately 30ha. The operational Station is predominantly built structures and hard standing, including access and car parks. Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study Area

The Site includes the land inside the HNB double security fence and the additional land that is covered by the HNB Nuclear Site Licence (NSL), as indicated on **Figure 1.1, Appendix A**. The area over which ecological features may be subject to significant effects, as a result of the HNB Decommissioning Project, is referred to as the potential 'Zone of Influence' (Chartered Institute of Ecology and Environmental Management ([CIEEM], 2018[1]), which varies for different ecological features depending on their sensitivity to environmental change together with the nature of the proposed works. It is therefore appropriate to define different 'Study Areas' to encompass the potential Zone of Influence.

The categories of ecological features that could be significantly affected by the HNB Decommissioning Project are summarised below. These are the sites, habitats and species that are of sufficient nature conservation value that impacts on them could result in significant effects:

- Statutorily designated biodiversity conservation sites (statutory biodiversity sites):
  - Special Areas of Conservation (SACs) – sites designated under Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive) as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive;
  - Special Protection Area (SPA) – sites designated under the European Council Directive 2009/147/EC on the conservation of wild birds (the Birds Directive). SPAs protect rare and vulnerable birds (listed on Annex I of the Birds Directive) and regularly occurring migratory species;
  - Sites of Special Scientific Interest (SSSIs) – these sites have been re-notified under the Wildlife and Countryside Act 1981 (as amended in Scotland) and provide statutory protection for the best examples of the UK's flora and fauna;
  - National Nature Reserves (NNRs) – these are designated under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981 (as amended) and contain examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems; and
  - Local Nature Reserves (LNRs) – these are declared under the National Parks and Access to the Countryside Act 1949 and managed for nature conservation.
- Designated non-statutory biodiversity conservation sites (non-statutory biodiversity sites):
  - Local Nature Conservation Sites (LNCSs) such as: Listed Wildlife Sites (LWS), Sites of Importance for Nature Conservation (SINC), Scottish Wildlife Trust (SWT) Wildlife Sites (including provisional SWT Wildlife Sites); and
  - Areas included on the Ancient Woodland Inventory (AWI) or Semi Natural AWI[2];

[1] Chartered Institute of Ecology and Environmental Management (CIEEM). (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Chartered Institute of Ecology and Environmental Management, Winchester.

[2] Ancient woodland is land that has been continually wooded since at least 1750. The Ancient Woodland Inventory (https://gateway.snh.gov.uk/natural-spaces/dataset.jsp?dsid=AWI) maps Scotland's ancient and mature woodlands.

- Important[3] habitats and species:
  - Habitats and species of principal importance for the conservation of biological diversity in Scotland – these habitats and species are included on the Scottish Biodiversity List[4] (SBL);
  - Bird species on the Birds of Conservation Concern (BoCC) Red List (Eaton et al 2015[5]).
  - Species listed as being of conservation concern in the relevant UK Red Data Book (RDB);
  - Nationally Scarce species - species recorded from between 16 and 100 10 x 10 km squares of the Ordnance Survey (OS) grid; and
  - Habitats and species listed in the Local (Ayrshire) Biodiversity Action Plan (LBAP).
- Legally protected species:
  - European Protected Species as defined within the EC Habitats Directive and translated into UK legislation through The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations);
  - Species included on Schedule 1, 5 and 8 of the Wildlife and Countryside Act 1981 (WCA) (as amended in Scotland), excluding species that are only protected in relation to their sale; and
  - Badgers, which are protected under the Protection of Badgers Act 1992, as amended by the Nature Conservation (Scotland) Act 2004.

Invasive/non-native species are also taken into account. In Scotland the spread of non-native plant species is covered by Section 14C of the Wildlife and Countryside Act 1981 (as amended in Scotland), which makes it an offence to plant or otherwise cause to grow any plant out-with its native range. Guidance on non-native species is set out within the Non-Native Species Code of Practice[6].

The study areas relating to each of the ecological features listed above have been defined on a precautionary basis to encompass the predicted 'Zone of Influence' of the Project. These areas have been defined based on the professional judgement of experienced ecologists, and informed by good practice guidance (e.g. CIEEM, 2018 and Collins, 2016[7]). The desk study areas relevant to terrestrial ecology are summarised below.

2.2 Desk Study

A desk-based study was undertaken in August 2019, in accordance with good practice (Chartered Institute of Ecology and Environmental Management (CIEEM) 2018). The Desk Study Area has been defined around the site on a precautionary basis:

- Statutory biodiversity sites within 10km;
- Non-statutory biodiversity sites within 3km;

[3] Ecological Assessment typically focuses on 'Important' ecological features (habitats, species, ecosystems and their functions/processes). 'Important' habitats and species are typically those that are not widespread, unthreatened and resilient to project impacts (CIEEM 2018).

[4] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation (https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL)

[5] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A, Gregory, R.D. (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746

[6] https://www2.gov.scot/Resource/0039/00398608.pdf

[7] Collins, J. (2016). *Bat Surveys: Good Practice Guidelines*. 3rd ed. Bat Conservation Trust, London

- Important habitats within 3km;
- Records of legally protected species and other important species within 3km, extended to 5km with respect to bats and bat roosts, recognising that the majority of bats' Core Sustenance Zones are within 5km of their roosts (Collins 2016); and
- Water bodies within 500m, which is the distance that great crested newts are generally regarded to disperse from waterbodies where they breed (English Nature, 20018)

Information regarding statutory biodiversity sites was acquired using the Scottish Natural Heritage (SNH) Sitelink web-based application[9] and the North Ayrshire Council website[10]. Records of important and legally protected species were obtained from the South West Scotland Environmental Information Centre (SWSEIC), formally known as Dumfries and Galloway Environmental Records Centre. The desk study focuses on species records within the last ten years. Information on non-statutory biodiversity sites was also obtained from the North Ayrshire Council website. Waterbodies were identified from 1:25:000 scale Ordnance survey (OS) maps[11] and aerial imagery (Google Maps[12] and Bing Maps[13]).

Recent, relevant documents relating specifically to biodiversity conservation and monitoring work undertaken by EDF Energy have also been reviewed for information relating to protected/notable species within the HNB land ownership boundary:

- Hunterston Integrated Land Management Plan (ILMP)[14]; and
- Hunterston B Annual Land Management Reviews (LMARs)[15].;

[8] English Nature. (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.
[9] https://gateway.snh.gov.uk/sitelink/searchmap.jsp
[10] https://www.maps.north-ayrshire.gov.uk/sites/ldp/
[11] www.ordnancesurvey.co.uk
[12] www.maps.google.co.uk
[13] https://www.bing.com/maps
[14] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.
[15] EDF Energy Nuclear Generation Ltd (2013 to 2018). Hunterston B Land Management Annual Review

3. Results

3.1 Designated biodiversity sites

There are four statutory biodiversity sites within 10km of the Site. There are 20 non-statutory biodiversity sites within 3km of the Site, these are Local Nature Conservation Sites (LNCS)[16], fifteen of these sites (referred to below as 'LNCS (AWI)') are also included on the Ancient Woodland Inventory (AWI). Further details of these sites are included in **Table 3.1** and on **Figure 3.1** and **3.2, Appendix A**.

Table 3.1 Statutory and non-statutory biodiversity sites

Site	Designation	Grid Reference	Summary reasons for designation	Proximity to the Site (Approx.)
STATUTORY SITES				
Portencross Woods	SSSI	NS 17736 50007	One of the best examples of semi-natural coastal woodland (Upland mixed ash woodland) in North Ayrshire. The botanically-rich woodland is situated on steep-sided maritime cliffs. Nationally scarce rock whitebeam is found within the partially vegetated cliffs. The ground flora is diverse and indicative of undisturbed woodland. The woodland is rich in bryophytes and lichens, including the nationally scarce lichen *Usnea wasmuthii*, and nationally scarce fungus that grows on lichens – *Sphinctrina turbinata*.	0.3km south west
Southannan Sands	SSSI	NS 18300 52300	One of the best examples of intertidal sandflats habitat within the coastal cell covering the Clyde coastline. The sandflats are mainly composed of fine to medium sheltered sands, with a small area of mud/silt at Fairlie Sands. Extensive areas of nationally scarce dwarf eelgrass (*Zostera noltei*) are a biologically and structurally important component.	0.17km north
Kames Bay	SSSI	NS 1711 5509	Kames Bay is an important educational research site for the study of inter-tidal marine biology.	2.1km north-west
Ballochmartin Bay	SSSI	NS 1818 5680	The most varied section of coast on Great Cumbrae. An important research site, the beach is backed by herb-rich grassland and roadside verges supporting slow worms (*Anguis fragilis*) and a number of uncommon higher plant species.	3.5km north

[16] A number of LNCS are categorised as SWT Wildlife Sites (or SWT Provisional Wildlife Sites). However, SWT no longer recognise these as SWT Wildlife Sites (*Scottish Wildlife Trust pers. comm. 27/11/19*) and this dataset is in the process of being updated (*North Ayrshire Council (Thom Ledingham) pers. comm. 27/11/19*).

Site	Designation	Grid Reference	Summary reasons for designation	Proximity to the Site (Approx.)
NON-STATUTORY SITES (Including AWI sites)				
Goldenberry Hill	LNCS	NS 18500 50800	Currently unavailable*	0.25km south
Cambelton Hill and Watermeadow	LNCS	NS 19120 50740	Currently unavailable*	0.5km south-east
Ardneil Bank Wood and Southbanks, Portencross	LNCS	NS 17805 49095	Currently unavailable*	1.75km south
Glen Burn (Crosbie to North Southannan)	LNCS	NS 20863 51919	Currently unavailable*	2km east
Seamill to Ardneil Bay	LNCS	NS 18665 48404	Currently unavailable*	2.3km south
Portencross Woods	LNCS (AWI)	NS 17800 49500	Ancient Woodland (semi-natural origin)	0.1km south-west
Goldenberry Hill	LNCS (AWI)	NS 18500 50800	Long established woodland (plantation origin)	0.2km south
Campbelton Wood	LNCS (AWI)	NS 19000 50900	Long established woodland (plantation origin)	0.36km south-east
Hunterston House Wood	LNCS (AWI)	NS 19400 51800	Long established woodland (plantation origin)	0.5km east
Thicket Plantation	LNCS (AWI)	NS 18300 49600	Long established woodland (plantation origin)	1.4km south
Kilruskin Wood	LNCS (AWI)	NS 20228 51793	Long established woodland (plantation origin)	1.5km east
Ardneil Bank Wood	LNCS (AWI)	NS 17700 49100	Long established woodland (plantation origin)	1.9km south-west
Carlung Wood	LNCS (AWI)	NS 19500 48900	Long established woodland (plantation origin)	2km south-east
Kilruskin Glen	LNCS (AWI)	NS 21000 51100	Long established woodland (plantation origin)	2km east
The Glen	LNCS (AWI)	NS 20700 52600	Ancient Woodland (semi natural origin)	2.1km north-east
Allan Wood	LNCS (AWI)	NS 20800 53100	Ancient Woodland (semi natural origin)	2.25km north-east
Ardneil, Portencross	LNCS (AWI)	NS 18740 48580	Ancient woodland (semi-natural origin)	2.25km south
Dykes Plantation	LNCS (AWI)	NS 21600 50900	Long established woodland (plantation origin)	2.7km east
The Avenue	LNCS (AWI)	NS 21300 49700	Long established woodland (plantation origin)	2.9km south-east
Southannan	LNCS (AWI)	NS 20800 53900	Other – mixed deciduous and coniferous mature woodland	3.1km north-east

* The reasons for designation of five of the LNCS are 'currently unavailable'. SWT no longer recognises these sites as SWT Wildlife Sites (*Scottish Wildlife Trust pers. comm. 27/11/19*) and this dataset is in the process of being updated (*North Ayrshire Council (Thom Ledingham) pers. comm. 27/11/19*). The available information on these sites is in **DRAFT** status only (**Appendix B**) and should not be relied upon to inform the EIA in the absence of further consultation with North Ayrshire Council.

3.2 Important habitats

AWI sites are included in the list of non-statutory biodiversity sites (Section 3.1). No additional information on the distribution of important habitats within 3km of the Site was available.

3.3 Legally protected and important species

Records held by SWSEIC

SWSEIC hold a total of 281 records of legally protected species and/or other important species within 3km of the site, within the past 10 years. The results are summarised in **Table 3.2**. SWSEIC do not hold records of any bat roosts within 5km of the site. Bat roosts recorded as part of monitoring to inform the Hunterston Annual Land Management Reviews are summarised in the section below. Further details of bat roosts are also included in a separate report (*Hunterston B Decommissioning EIA – Baseline Report: Bats*).

Table 3.2 Records of legally protected and other important species

Common	Scientific name	Records	Most recent record	Legal / priority status
Terrestrial Mammal				
Otter	*Lutra lutra*	1	2015	EPS; SBL; LBAP
Badger	*Meles meles*	1	2015	Protection of Badger Act 1992
Brown hare	*Lepus europaeus*	6	2016	SBL
Common Pipistrelle	*Pipistrellus pipistrellus*	3	2016	W&C; EPS; SBL; LBAP
Soprano pipistrelle bat	*Pipistrellus pygmaeus*	2	2016	W&C; EPS; SBL; LBAP
Brown Long-eared Bat	*Plecotus auritus*	1	2016	W&C; EPS; SBL
Myotis bat species	*Myotis sp.*	1	2016	W&C; EPS; SBL
Marine mammal				
Common seal	*Phoca vitulina*	3	2012	SBL, Marine (Scotland) Act 2010
Common porpoise	*Phocoena phocoena*	2	2012	SBL; EPS
Birds				
Arctic Tern	*Sterna paradisaea*	1	2009	SBL
Barn Owl	*Tyto alba*	4	2010	WCA(Sch1); SBL
Barnacle goose	*Branta leucopsis*	2	2017	SBL
Bar-tailed godwit	*Limosa lapponica*	23	2015	SBL
Black-headed gull	*Chroicocephalus ridibundus*	90	2015	SBL
Black-throated diver	*Gavia arctica*	4	2010	WCA(Sch1); SBL
Bullfinch	*Pyrrhula pyrrhula*	19	2015	SBL

Common	Scientific name	Records	Most recent record	Legal / priority status
Common crossbill	*Loxia curvirostra*	2	2010	WCA(Sch1)
Common tern	*Sterna hirundo*	4	2010	SBL
Curlew	*Numenius arquata*	105	2015	SBL; BoCC (red)
Dunlin	*Calidris alpina*	19	2015	SBL
Dunnock	*Prunella modularis*	104	2015	SBL
Golden plover	*Pluvialis apricaria*	7	2010	SBL
Goldeneye	*Bucephala clangula*	3	2017	WCA(Sch1)
Grasshopper warbler	*Locustella naevia*	11	2012	SBL; BoCC (red)
Greenland greater white fronted goose	*Anser albifrons subsp. flavirostris*	2	2011	SBL
Greenshank	*Tringa nebularia*	24	2015	WCA(Sch1)
Grey Partridge	*Perdix perdix*	5	2009	SBL; BoCC (red); LBAP
Grey Wagtail	*Motacilla cinerea*	16	2015	BoCC (red)
Herring gull	*Larus argentatus*	115	2015	SBL; BoCC (red)
Hooded crow	*Corvus cornix*	38	2015	SBL
House sparrow	*Passer domesticus*	115	2015	SBL; BoCC (red)
Kestrel	*Falco tinnunculus*	17	2014	SBL
Kingfisher	*Alcedo atthis*	4	2010	WCA(Sch1); SBL
Kittiwake	*Rissa tridactyla*	5	2013	BoCC (red)
Lapwing	*Vanellus vanellus*	28	2015	SBL; BoCC (red)
Lesser redpoll	*Acanthis cabaret*	15	2014	SBL; BoCC (red)
Linnet	*Linaria cannabina*	18	2015	SBL; BoCC (red); LBAP
Merlin	*Falco columbarius*	5	2011	WCA(Sch1); SBL; BoCC (red)
Mistle thrush	*Turdus viscivorus*	41	2015	BoCC (red)
Pied flycatcher	*Ficedula hypoleuca*	1	2009	BoCC (red)
Puffin	*Fratercula arctica*	3	2011	BoCC (red)
Red-throated diver	*Gavia stellata*	10	2015	WCA(Sch1); SBL
Reed bunting	*Emberiza schoeniclus*	17	2011	SBL; LBAP
Ringed plover	*Charadrius hiaticula*	28	2015	BoCC (red)

Common	Scientific name	Records	Most recent record	Legal / priority status
Sandwich tern	*Sterna sandvicensis*	20	2015	SBL
Shag	*Phalacrocorax aristotelis*	65	2015	BoCC (red)
Siskin	*Spinus spinus*	31	2015	SBL
Skylark	*Alauda arvensis*	20	2015	SBL; BoCC (red); LBAP
Song thrush	*Turdus philomelos*	53	2015	SBL; BoCC (red); LBAP
Spotted flycatcher	*Muscicapa striata*	10	2012	SBL; BoCC (red); LBAP
Starling	*Sturnus vulgaris*	117	2015	SBL; BoCC (red)
Swift	*Apus apus*	20	2014	SBL
Twite	*Linaria flavirostris*	11	2014	SBL; BoCC (red)
Whinchat	*Saxicola rubetra*	1	2011	BoCC (red)
Wood warbler	*Phylloscopus sibilatrix*	5	2014	SBL; BoCC (red)
Woodcock	*Scolopax rusticola*	6	2011	SBL; BoCC (red)
Yellowhammer	*Emberiza citrinella*	8	2015	SBL; BoCC (red)
Amphibians				
Common Toad	*Bufo bufo*	3	2016	SBL
Reptiles				
Common lizard	*Zootoca vivipara*	4	2012	W&C; SBL
Invertebrates				
Small heath	*Coenonympha pamphilus*	5	2013	SBL
Grayling	*Hipparchia semele*	17	2016	SBL
Shaded Boar-bar	*Scotopteryx chenopodiata*	4	2016	SBL
Latticed heath	*Chiasmia clathrata*	1	2016	SBL
White Ermine	*Spilosoma lubricipeda*	1	2016	SBL
Garden tiger	*Arctia caja*	1	2016	SBL
Cinnabar	*Tyria jacobaeae*	5	2016	SBL
Ear moth	*Amphipoea oculea*	1	2016	SBL
Red mason bee	*Osima rufa*	2	2018	SBL

Common	Scientific name	Records	Most recent record	Legal / priority status
Flowering Plants				
Bluebell	*Hyacinthoides non-scripta*	3	2018	WCA
Non-native invasive species				
Japanese knotweed	*Fallopia japonica*	3	2016	WCA(Sch9)

EPS –European Protected Species are protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations)

W&C - included on Schedule 5 or 8 of the Wildlife and Countryside Act 1981 (as amended)

SBL – Scottish Biodiversity List;

WCA(Sch1) – Bird species listed on schedules 1, 1A or A1 of the Wildlife & Countryside Act 1981 (as amended in Scotland);

BoCC (red) – Birds of Conservation Concern (BoCC) Red List (Eaton et al 2015).

WCA(Sch9) – Non-native species listed in Schedule 9 (parts 1 and 2) of the Wildlife and Countryside Act 1981 (as amended) and includes animals and plants which may not be released or allowed to escape into the wild.

LBAP – North Ayrshire Biodiversity Action Plan species

RDB - Red Data Book species.

Species reported in ILMPs and LMARs

Species records within the HNB estate detailed in the ILMP and LMARs are briefly summarised in **Table 3.3**.

Table 3.3 Summary of species surveys/records from ILMPs and LMARs

Species/Group	Year	Key findings
Breeding birds	2003, 2006, 2011, 2015, 2017	Notable species (Red or Amber list of birds of conservation concern and/or on the Scottish Biodiversity List) recorded include linnet, starling, song thrush, mistle thrush, spotted flycatcher, reed bunting, dunnock, meadow pipit, willow warbler, grasshopper warbler, bullfinch, lapwing, mallard and oystercatcher.
Wintering birds	2014/15; and 2016/17	Peregrine (*Falco peregrinus)* and hen harrier (*Circus cyaneus)*; regionally important numbers of linnet; locally important population of twite, Species recorded on the intertidal mud/sand in exceedance of 1% of regional population: shelduck (*Tadorna tadorna)*, mallard (*Anas platyrhynchos)*, curlew, oystercatcher (*Haematopus ostralegus)*, common gull (*Larus canus)*. Locally important numbers of black guillemot (*Cepphus grylle)*, turnstone (*Arenaria interpres)*, black-headed gull and herring gull. Other notable species include woodcock, snipe (*Gallinago gallinago)*, fieldfare (*Turdus pilaris)*, black-throated diver, skylark, meadow pipit (*Anthus pratensis)*, lesser redpoll, Eider (*Somateria mollissima)*, kittiwake, redshank (*Tringa totanus)*, redwing (*Turdus iliacus),* ringed plover
Bats	2015, 2016, 2017, 2018	Inspections of bat boxes around the Hunterston estate recorded roosting bats, including but not necessarily limited to soprano pipistrelle and common pipistrelle)
[redacted]	[redacted]	[redacted]
Otter	2012, 2016	Survey of Hunterston estate (2012) did not record otter. Dead otter reported on the access road (2016).
Invertebrates	2014, 2015, 2016, 2017, 2018	Surveys have generally recorded butterfly and moth species that are common to Ayrshire, with a small number of more notable/uncommon moth species and also small heath (*Coenonympha pamphilus)*, which is a Scottish Biodiversity List (SBL) species.

Species/Group	Year	Key findings
Other incidental records	-	Osprey (*Pandion haliaetus)*, teal (*Anas crecca)*, little egret, brown hare, European eel (*Anguilla anguilla), brown/sea trout (Salmo trutta), Agriphila latistria*, (a grass moth - new Ayrshire record), Brussels lace (*Cleorodes lichenaria* - first record for North Ayrshire) Two Invasive non-native species: Himalayan Balsam (*Impatiens glandulifera*) and *Rhododendron ponticum; and* Sea buckthorn (*Hippophae rhamnoides*), a native, invasive species.

Appendix A
Figures

H:\Projects\41491 NTH Ecology EIA Scoping for Phase 1 Decommissioning (subfolder)\D Design Technical\HNB\Drawings\ArcGIS\41491-WOD-XX-XX-FG-OE-0037_S2_P02.mxd Originator: jacqui.parkin

217000 218000 219000 220000 221000

653000 652000 651000 650000

N

Jetty
Hunterston Construction Yard
Black Rock
Ore Terminal
Southannan Mains
A78
FB
Allan Wood
53
27
Hunterston Ore Terminal
Glenside
Castle Hill Homestead
The Glen
Hunterston Sands
Brigurd Point
Poteath
Poteathbank Cottage
Reservoir
Gull's Walk
Jetty
Inner Brigurd Point
Shore Cottage
52
Biglies Farm
Biglees Hill
Coastal Path
Hillhouse
Stoney Port
Landing Stage
Ayrshire
Hunterston House
Kilruskin Wood
Hunterston Castle
Burn Gill
Little Brigurd
HUNTERSTON 'A'
Hunterston Nuclear Generating Station
Goldenberry
Resr
Campbelton
Campbelton Hill
North Kilruskin
51
Dam
Kilruskin Bridge
Castle Knowe
Spr
Pier
South Kilruskin
17
Hawking Craig
18
Blue Stones
Goldenberry Hill
140
19
20
Millstonford Bridge
Highthorn Bridge
21
The Three Sisters
Ardneil Hill
Millstonford
50
Thirdpart
Bushglen Bridge
Bushglen
Jenny's Dyke
Waterside Hill
Northbank
Thirdpart Holdings
B782
Carlung Farm
Thicket Plantation
Cat

Key

Double security fence

Hunterston B Nuclear Site Licence boundary

0 250 500 750 m

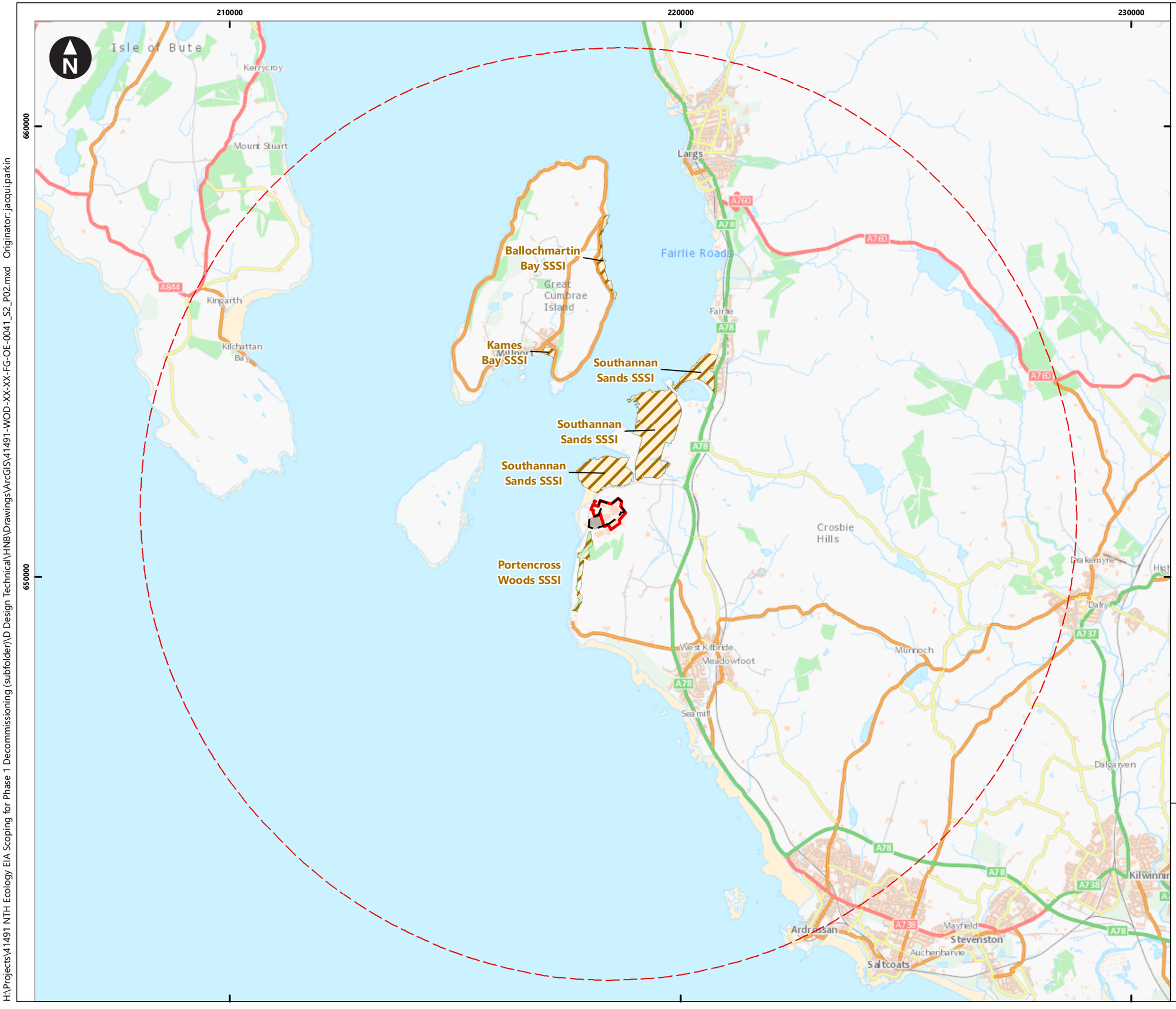
Scale at A3: 1:15,000

Hunterston B Decommissioning EIA Baseline Report: Desk Study (Terrestrial Ecology)

Figure 1.1
Site location plan

November 2019

wood.



Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- 10km search area around the Site
- Site of Special Scientific Interest (SSSI)

0 1,000 2,000 3,000 4,000 m

Scale at A3: 1:80,000

Hunterston B Decommissioning EIA Baseline Report: Desk Study (Terrestrial Ecology)

Figure 3.1
Statutory biodiversity sites

November 2019

wood.

H:\Projects\41491 NTH Ecology EIA Scoping for Phase 1 Decommissioning (subfolder)\D Design Technical\HNB\Drawings\ArcGIS\41491-WOD-XX-XX-FG-OE-0041_S2_P02.mxd Originator: jacqui.parkin

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215000 216000 217000 218000 219000 220000 221000 222000

654000 653000 652000 651000 650000 649000

N

HUNTERSTON 'A'

Southannan

Allan Wood

The Glen

Kilruskin Wood

Glen Burn (Crosbie to North Southannan)

Hunterston House Wood

Kilruskin Glen

Dykes Plantation

Campbelton Wood

Goldenberry Hill

Cambelton Hill and Watermeadow

Goldenberry Hill

Portencross Woods

Thicket Plantation

The Avenue

Ardneil Bank Wood

Ardneil Bank Wood and Southbanks, Portencross

Carlung Wood

Ardneil, Portencross

Seamill to Ardneil Bay

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- 3km buffer
- Local Nature Conservation Sites (LNCS)
- Local Nature Conservation Sites (AWI)

0 500 1,000 1,500 m

Scale at A3: 1:25,000

Hunterston B Decommissioning EIA Baseline Report: Desk Study (Terrestrial Ecology)

Figure 3.2
Non-statutory biodiversity sites

November 2019

wood.

Appendix B
Information on LNCS (DRAFT)

Site name: Seamill to Ardneil Bay
Site number: 30 **Grid Ref:** NS191477
Date: June 2015

Introduction
The site includes a broad area of maritime rock and sandy beaches with a narrow fringe of sandy dune grassland to the shore. The latter has been reinforced with boulders along much of its length but sandy vegetation has colonised. In the east the site adjoins buildings to the edge of Seamill and further west it is adjacent to the large golf course, and in the far west there is a large arable field.

Vegetation
There is only a limited and narrow strandline vegetation present (some *Honckenya peploides* and the occasional clump of *Elytrigia* sp.), presumably reflecting the abrupt transition caused by the boulders. The colonised boulders support sandy vegetation with frequent *Leymus arenarius* and only local *Ammophila*; associates include typical commoner edge species such as *Carex arenaria, Rumex crispus, Sonchus arvensis, Potentilla anserina, Tripleurospermum maritimum, Raphanus maritimus, Cochlearia officinalis* and rarely *Cakile maritima*.

The upper edge of the boulders, adjacent to the path, and generally on the landward side of the path, supports a short to coarse sandy grassland; *Festuca rubra* is common with *Lotus corniculatus*, P*lantago lanceolata, Potentilla anserina, Carex arenaria*, *Trifolium* spp. Etc. A few small, broader areas by the path are of note for supporting species such as *Conopodium majus, Ranunculus bulbosus, Galium verum, Viola canina* and *Vicia sativa* ssp. *angustifolia*.

NVC: MG5; MG1, SD2, SD3, SD4, SD5, SD7, SD8,

Species *Bolboschoenus, Elytrigia* sp., *Viola canina, Ranunculus bulbosus, Senecio sylvaticus*

Comment
An extensive area of coastal habitat but with limited areas of particular note and generally narrow and past disturbed by engineering works. The maritime zone is of particular value for birds, making the site's interest both botanical and ornithological. It is expected that it would also do well on the grounds of marine invertebrates, seaweeds and other rock-pool life.
After consideration, the review proposes the extension of the site westwards to include the contiguous coastal habitat previously included in 120 Portencross LNCS. It seems logical to gather all similar habitat in one site and to leave the cliff and dyke habitats together in 120 Portencross.

Target Notes

1	19619	47533	Dune colonising boulders with Leymus, Carex arenaria, Festuca rubra; strandline below with Atriplex and some Honckenya and rare Cakile maritima; bryophytes limited but include some Tortula ruraliformis. Coarser and rank above towards the path/car park.
2	19820	47398	Car park edge with some sandy grassland (Festuca rubra, Poa humilis, Lotus, Trifolium) but becoming rank with Elytrigia repens, nettle etc.
3	19889	47421	Extensive area of rough grass with few maritime species noted. Equisetum arvense dominates much of the northwest (with Ranunculus repens, Plantago lanceolata, Juncus effusus); further east there is more scrub (gorse, Rosa rugosa – some Japanese knotweed) plus tall herbs indicating disturbance (e.g. Aegopodium podagraria, Tussilago farfara, Symphytum x uplandicum)
4	19414	47661	Marram grass to boulders; large patch of Rosa rugosa to fence
5	19378	47704	Broad path with narrow rough grass fringe (Raphanus, Elytrigia, Plantago lanceolata, Urtica, Aegopodium); boulders to tide edge with Leymus, Rumex crispus, Sonchus, Potentilla anserina and some Honckenya on sand – also some foreshore Elytrigia.
6	19302	47734	Rock outcrop with some Armeria and Plantago maritima; lichens include some Ramalina, and the moss Schistidium maritimum.
7	19199	47870	Golf course with large sandy bund (much Elytrigia repens and Cirsium arvense) – short grass to fairway roughs and dense gorse and Rosa rugosa stands.
8	19147	47907	Sandy grassland with some diversity: Ranunculus bulbosus, Conopodium majus, Vicia sativa ssp. angustifolia, Lotus corniculatus, Trifolium spp. and dune species. Boulders below with some Elytrigia, Leymus, Sonchus etc.
9	18955	48223	Stand of Bolboschoenus on strandline. Sandy dune vegetation on boulders with some marram grass.
10	18882	48316	Broad strip of dune grassland with good diversity: Lotus corniculatus, Conopodium majus, Ranunculus bulbosus, Galium verum, Viola canina, Vicia sativa ssp. angustifolia etc.; some marram grass to dune boulders below.
11	18752	48383	Mound near workings with scrubby (windswept) ivy, gorse, sycamore (shrub), Rubus and Escallonia; rare Senecio sylvaticus.
12	18497	48491	Narrow strips of grassland to either side of path with Festuca rubra, Elytrigia repens, Poa humilis, Lotus, Plantago, Trifolium etc. Boulders below with Leymus, Raphanus, Cochlearia, Tripleurospermum, Sonchus, occasional marram; Honckenya to sand edge. Some Rosa rugosa stands.
13	18343	48535	Bouldery embankment rank and weedy in top (Raphanus, Urtica) with some sandy dune colonists below: Leymus, Elytrigia (shore form), Tripleurospermum, Rumex crispus, Sonchus arvensis and Potentilla anserina.

The target notes below were formerly associated with features in 120 Portencross LNCS			
14	17574	49007	Coastal grassland, quite rank, with a few coastal species but mainly semi-improved neutral grass appearance (Lolium perenne, Arrhenatherum elatius, Elytrigia repens, Agrostis spp., Plantago lanceolata, Trifolium spp., Centaurea nigra, plus thistle and ragwort).
15	17712	48625	Narrow strip of shore grassland with saltmarsh to the fringe; species include Trifolium pratense, Carex flacca, Odontites vernus, Euphrasia sp.; some marshy areas occur with Juncus, Iris and Carex disticha.
16	17842	48507	Narrow inlet with saltmarsh (Aster, Puccinellia, Cochlearia, Glaux maritima, Juncus gerardii and some J. maritimus). Diverse short grassland to the saltmarsh margins.

2015/16 Plant List

[Un-highlighted = June 2015; highlighted = G Smart 2 August 2016 additions for area between Target Notes 14 and 15]

Taxon	**Common name**
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Achillea ptarmica	sneezewort
Aegopodium podagraria	Ground-elder
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Ammophila arenaria	Marram
Angelica sylvestris	Wild Angelica
Arctium minus	Lesser Burdock
Armeria maritima	Thrift
Arrhenatherum elatius	False Oat-Grass
Artemisia vulgaris	Mugwort
Aster tripolium	sea aster
Atriplex prostrata	Spear-leaved Orache
Bellis perennis	Daisy
Bolboschoenus maritimus	Sea Club-rush
Bromus hordeaceus	Soft-brome
Carex arenaria	Sand Sedge
Carex disticha	Brown sedge
Carex flacca	Glaucous sedge
Carex hirta	hairy sedge
Carex otrubae	false fox-sedge
Centauria nigra	hardheads
Cerastium fontanum	Common Mouse-ear
Cirsium arvense	Creeping Thistle
Claytonia sibirica	Pink Purslane
Cochlearia officinalis sens. lat.	scurveygrass
Conopodium majus	Pignut
Crataegus monogyna	Hawthorn
Crocosmia paniculata	Aunt-Eliza

Crocosmia x crocosmiiflora	Montbretia (C. aurea x pottsii)
Dactylis glomerata	Cock's-foot
Dipsacus fullonum sens. lat.	Wild Teasel
Elytrigia repens agg.	couch grass
Epilobium hirsutum	Great Willowherb
Epilobium palustris	marsh willowherb
Equisetum arvense	Field Horsetail
Erigeron glaucus	Seaside Daisy
Escallonia rubra var. macrantha	Escallonia
Euphrasia agg.	eyebright
Fallopia japonica	Japanese Knotweed
Festuca rubra agg.	Red Fescue
Filipendula ulmaria	Meadowsweet
Galium aparine	Cleavers
Galium verum	Lady's Bedstraw
Geranium pratensis	meadow crane's-bill
Glaux martima	sea milkwort
Gnaphalium uliginosum	marsh cudweed
Hedera hibernica	Atlantic Ivy
Heracleum sphondylium	Hogweed
Holcus lanatus	Yorkshire-fog
Holcus mollis	Creeping Soft-grass
Honckenya peploides	Sea Sandwort
Hyacinthoides non-scripta	Bluebell
Hyacinthoides x massartiana	Hybrid Bluebell (H. non-scripta x hispanica)
Hydrocotyle vulgaris	marsh pennywort
Hypochaeris radicata	Cat's-ear
Ilex aquifolium	Holly
Iris pseudacorus	Yellow Iris
Juncus articulatus	jointed rush
Juncus bufonius	toad rush
Juncus effusus	Soft-rush
Juncus gerardii	saltmarsh rush
Juncus maritimus	Sea rush
Lathyrus pratensis	Meadow Vetchling
Leymus arenarius	Lyme-grass
Ligusticum scoticum	Scots Lovage
Lolium perenne	Perennial Rye-grass
Lotus corniculatus	Common Bird's-foot-trefoil
Lotus pedicularis	greater bird's-foot trefoil
Luzula campestris	Field Wood-rush
Lysimachia punctata	Dotted Loosestrife
Lythrum salicaria	purple loosestrife
Matricaria discoides	pineappleweed
Mentha spicata	Spear Mint
Odontites vernus	Red Bartsia
Oenanthe crocata	Hemlock Water-dropwort

Oenanthe lachenalii	parsley water-dropwort
Persicaria amphibia	amphibius bistort
Phalaris arundinacea	Reed Canary-grass
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Plantago maritima	Sea Plantain
Poa annua	Annual Meadow-grass
Poa humilis	Spreading Meadow-grass
Poa pratensis sens. lat.	Smooth Meadow-grass
Poa trivialis	Rough Meadow-grass
Polygonum aviculare	knotgrass
Potentilla anserina	Silverweed
Potentilla erecta	tormetil
Puccinellia maritima	Saltmarsh grass
Pterdium aquilinum	bracken
Ranunculus acris	meadow buttercup
Ranunculus bulbosus	Bulbous Buttercup
Ranunculus repens	Creeping Buttercup
Raphanus raphanistrum subsp. maritimus	Sea Radish
Rhinanthus minor	yellow rattle
Rubus fruticosus agg.	Bramble
Rumex acetosella	Sheep's Sorrel
Rumex crispus subsp. littoreus	Curled Dock
Rumex obtusifolius	Broad-leaved Dock
Sagina procumbens	Procumbent Pearlwort
Salicornia agg.	glasswort
Senecio jacobaea	Common Ragwort
Senecio sylvaticus	Heath Groundsel
Senecio vulgaris	Groundsel
Silene dioica	Red Campion
Sonchus arvensis	Perennial Sow-thistle
Sorbus aucuparia	rowan
Spergula arvensis	corn spurrey
Stellaria media	chickweed
Symphytum x uplandicum	Russian Comfrey (S. asperum x officinale)
Taraxacum agg.	Dandelion
Trifolium dubium	Lesser Trefoil
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Tripleurospermum maritimum	Sea Mayweed
Triglochin maritima	sea arrowgrass
Tussilago farfara	Colt's-foot
Ulex europaeus	Gorse
Urtica dioica	Common Nettle
Veronica chamaedrys	Germander Speedwell
Viccia cracca	tufted vetch

Vicia hirsuta	hairy tare
Vicia sativa subsp. nigra	Narrow-leaved Vetch
Viola canina	Heath Dog-violet

Species Total: 125

Fauna

Invertebrates

The diversity and rarity of marine invertebrates is likely to be good.

Birds

Fat Birder, describing 'Seamill shore': Water Pipit, Shore Lark, Snow Bunting and Black Redstart all recorded in the past plus at the right time Skuas and even Little Auk offshore. Jack Snipe are regular in winter but elusive.

Birds

Note provided by Ayrshire RSPB members.

A good variety of birds can be observed from this stretch of coast. The off shore rocks and islets are roosting sites for Cormorant, Shag and Eider, also for waders including Purple Sandpiper, Redshank, Turnstone and Oystercatcher. The Kilbride Burn enters the sea adjacent to the Seamill Hydro and this is used by bathing gulls and ducks including Mallard, Eider, Teal and Wigeon. Grey Wagtail, Dipper and Kingfisher have all been recorded at this site. A Black Redstart has wintered here several times. It is also a popular spot for sea watching and species including Gannet, Manx Shearwater and Storm Petrel have been recorded from this stretch. 64 species are listed below:

Species
Arctic Tern *Sterna paradisaea*
Bar-tailed Godwit *Limosa lapponica*
Black-headed Gull *Larus ridibundus*
Black Guillemot *Cepphus grylle*
Black Redstart *Phoenicurus ochruros*
Carrion Crow *Corvus corone*
Common Gull *Larus canus*
Common Tern *Sterna hirundo*
Cormorant *Phalacrocorax carbo*
Curlew *Numenius arquata*
Dipper *Cinclus cinclus*
Dunlin *Calidris alpina*
Eider *Somateria mollissima*
Fulmar *Fulmarus glacialis*
Gannet *Morus bassanus*
Goldeneye *Bucephala clangula*

Great Black-backed Gull *Larus marinus*
Great Crested Grebe *Podiceps cristatus*
Grey Heron *Ardea cinerea*
Grey Wagtail *Motacilla cinerea*
Greylag Goose *Anser anser*
Guillemot *Uria aalge*
Herring Gull *Larus argentatus*
Hooded Crow *Corvus cornix*
House Sparrow *Passer dometicus*
Jackdaw *Corvus monedula*
Kestrel *Falco tinnunculus*
Kingfisher *Alcedo atthis*
Kittiwake *Rissa tridactyla*
Lapwing *Vanellus vanellus*
Lesser Black-backed Gull *Larus fuscus*
Linnet *Carduelis cannabina*
Manx Shearwater *Puffinus puffinus*
Mallard *Anas platyrhynchos*
Meadow Pipit *Anthus pratensis*
Mute Swan *Cygnus olor*
Oystercatcher *Haematopus ostralegus*
Peregrine *Falco peregrinus*
Pied Wagtail *Motacilla alba*
Purple Sandpiper *Calidris maritima*
Raven *Corvus corax*
Razorbill *alca torda*
Red-breasted Merganser Mergus serrator
Redshank *Tringa totanus*
Redstart *Phoenicurus phoenicurus*
Reed Bunting *Emberiza schoeniclus*
Rock Dove *Columba livia*
Rock Pipit *Anthus petrosus*
Sandwich Tern Thalasseus sandvicensis
Sedge Warbler *Acrocephalus schoenobaenus*
Shag *Phalacrocorax aristotelis*
Skylark *Alauda arvensis*
Sparrowhawk *Accipiter nisus*
Starling *Sturnus vulgaris*
Stonechat *Saxicola rubicola*
Storm Petrel *Hydrobates pelagicus*
Swallow *Hirundo rustica*

Swift *Apus apus*
Teal *Anas crecca*
Turnstone *Arenaria interpres*
Wheatear *Oenanthe oenanthe*
Whimbrel *Numenius phaeopus*
White Wagtail *Motacilla alba*
Wigeon *Anas penelope*

Mammals

Common Seal *Phoca vitulina*
Otters *Lutra lutra* are occasionally seen (G. Smart pers.com.)

Miscellaneous

Continuity with Portencross Site of Special Scientific Interest (SSSI).
The beach beside the Kilbride Burn is used by West Kilbride Primary for environmental education.
This stretch of beach is popular with walkers, birdwatchers, photographers, runners and swimmers.
It is within a wildlife corridor and linked to other LNCSs.

Site name: Ardneil Woodland
Site number: 68 **Grid Ref.** NS187485
Date: 7th June 2015

Introduction
The site is a very narrow strip of windswept sycamore on a short south-facing embankment running parallel to the Portencross minor road; recent building of houses and golf course buildings has severed any former connectivity depicted in the original site boundary. The best woodland examples are in the west (some of which were not including within the original site boundary) but further east there is scarcely any tree canopy remaining and only a few woodland herbs persist in a grassy ground cover.

Vegetation
The canopy in the west is dominated by fairly old but quite gnarled and windswept sycamore with only a few young elms, hawthorn, alder or elder noted. Bluebells are frequent but many seem crossed with hybrid populations. Ferns are frequent with ivy, *Ficaria verna, Silene dioica, Viola riviniana*, ivy and various grasses. Some damp areas support *Allium ursinum* and *Stachys sylvatica*, or *Oenanthe crocata* and *Iris* where wetter still.

NVC: W8/9; W23; U4;

Species: *Allium ursinum, Hyacinthoides non-scripta; Phyllitis scolopendrium*

AWI
The site was included in the NAC list on the basis of being in the Ancient Woodland Inventory, as 'Long-Established (of plantation origin)'.

Comment:
This woodland site is very small and becoming increasingly fragmented by development. Although several woodland indicator species are present, with its small size, it is hard to justify it being considered as a high quality site at a county level.

Target Notes

1	18347	48710	Strip of similar woodland to that further east but by a small water course flowing down from farm. Sycamore dominates with some elm and elder. Ground cover with bluebell (don't appear pure native) with ferns, ivy, Ficaria verna, Poa trivialis and below (by burn) frequent Allium ursinum; bryophytes well represented by burn.
2	18405	48701	Windswept sycamores on embankment to north side of road (some elm regeneration). Ground cover with ferns, bluebell, ivy, Silene, Viola riviniana, Aegopodium podagraria, Ficaria verna and Geranium robertianum; some Oenanthe crocata and Iris pseudacorus to east near house.
3	18479	48658	Sycamore woodland also occurs in a similar narrow strip to the south side of the road, where conditions a bit damper with Allium ursinum, Silene dioica, Stachys sylvatica, Ficaria verna, Geum urbanum, Claytonia sibirica,

			ferns and bramble.
4	18596	48632	Open scrubby area but quite damp with Oenanthe crocata, ferns, Phragmites australis and some alder.
5	18654	48638	Open sycamore wood to north side with a grassy flora (grazing?) but some Conopodium majus and bracken.
6	18714	48607	Open woodland incorporated into gardens with many exotics planted (including some conifers).
7	18818	48579	Open paddock with some gorse stands (rare tree below); grassland semi-improved but with many bluebells emergent (and some bracken) indicating woodland relics.
8	18951	48570	Isolated area of open sycamore but grazed improved ground cover with much thistle and nettle.
9	18991	48450	Narrow embankment behind new shed with dense gorse or bramble, a few sycamores, but only local bluebell and pignut grassland.
10	19035	48434	Open grassy embankment (grazed?) with a few remnant sycamore (some dead new plantings) but mainly dominated by grasses (Arrhenatherum elatius, Anthoxanthum odoratum, Poa humilis, Festuca rubra, Agrostis capillaris, Holcus spp.) with Rumex acetosa, Plantago lanceolata but some bluebell and pignut; dense tall herbs below by the drain.

2015 Plant List

Taxon	**Common name**
Acer pseudoplatanus	Sycamore
Aegopodium podagraria	Ground-elder
Alliaria petiolata	Garlic Mustard
Allium ursinum	Ramsons
Alnus glutinosa	Alder
Anthoxanthum odoratum	Sweet Vernal-grass
Anthriscus sylvestris	Cow Parsley
Arrhenatherum elatius	False Oat-Grass
Asplenium adiantum-nigrum	Black Spleenwort
Asplenium scolopendrium	Hart's-tongue
Athyrium filix-femina	Lady-fern
Cardamine flexuosa	Wavy Bitter-cress
Cerastium fontanum	Common Mouse-ear
Claytonia sibirica	Pink Purslane
Conopodium majus	Pignut
Crataegus monogyna	Hawthorn
Crocosmia x crocosmiiflora	Montbretia (C. aurea x pottsii)
Dactylis glomerata	Cock's-foot
Dryopteris affinis agg.	Scaly Male-fern
Dryopteris filix-mas	Male-fern
Equisetum fluviatile	Water Horsetail

Ficaria verna	Lesser Celandine
Galium aparine	Cleavers
Geranium robertianum	Herb-Robert
Geum urbanum	Wood Avens
Glechoma hederacea	Ground-ivy
Hedera helix agg.	Ivy
Heracleum sphondylium	Hogweed
Hyacinthoides hispanica	Spanish Bluebell
Hyacinthoides non-scripta	Bluebell
Hyacinthoides x massartiana	Hybrid Bluebell (H. non-scripta x hispanica)
Iris pseudacorus	Yellow Iris
Ligustrum ovalifolium	Garden Privet
Luzula sylvatica	Great Wood-rush
Myosotis arvensis	Field Forget-me-not
Oenanthe crocata	Hemlock Water-dropwort
Ornithogalum umbellatum subsp. campestre	Star-of-Bethlehem
Pentaglottis sempervirens	Green Alkanet
Phalaris arundinacea	Reed Canary-grass
Phragmites australis	Common Reed
Poa pratensis sens. lat.	Smooth Meadow-grass
Poa trivialis	Rough Meadow-grass
Pteridium aquilinum	Bracken
Ranunculus repens	Creeping Buttercup
Rubus fruticosus agg.	Bramble
Rubus idaeus	Raspberry
Rumex acetosa	Common Sorrel
Rumex obtusifolius	Broad-leaved Dock
Sambucus nigra	Elder
Silene dioica	Red Campion
Stachys sylvatica	Hedge Woundwort
Ulex europaeus	Gorse
Ulmus glabra	Wych Elm
Veronica chamaedrys	Germander Speedwell
Vicia sepium	Bush Vetch
Viola riviniana	Common Dog-violet
Rosa 'Hollandica'	Dutch Rose

Plant Total: 57

Fauna

Because of the poor quality of the habitat and lack of botanical interest, it was not considered necessary to go seeking faunal records. The habitat is obviously below the threshold where this would make any difference to the assessment decision.

Miscellaneous

Very close to the Seamill to Ardneil Bay and the Portencross LNCSs.

Site name: Campbelton Hill & Watermeadow
Site number: 118
Date: 3rd September 2015

Introduction

The site is centred about the old Campbelton farm but is divided into two different parts: to the west side, the ridge of Campbelton Hill and low-lying marshy pastures on the eastern side. The site was surveyed in 1999 by Gill Smart (as part of the SWT survey of the general area of 'Hunterston to Portencross and Goldenberry Hill') and this indicates that there has been changes in vegetation. On the hill bracken and scrub have increased at the expense of acid grassland. In the wetland the trend is less clear as superficially the site supports more rush than previously noted, but less of the previously coded inundation pasture, and this picture is complicated by the recent severe drainage that has occurred.

A species list, habitat map and set of target notes are provided.

Vegetation

The hill is dominated by bracken throughout most of the centre extending up to the summit ridge (where a little more scrub); it is very difficult to access. The scrub tends to be of gorse (and bramble) with some rowan or other trees emerging locally, and there is some rhododendron in the south (hard to access).

Two areas of woodland plantation occur on the eastern and western margin embankments. Both are on steep slopes and support canopies of sycamore with some oak, ash, elm and the occasional relic larch. The ground cover reflects generally acidic soils with some impact from recent or historical grazing with some open grassy areas; other areas though (more so in the east) support dense bracken. The woodland herb diversity appears to be fairly limited with typically bramble, *Dryopteris dilatata, Oxalis acetosella, Veronica chamaedrys, Viola riviniana, Silene dioica, Urtica dioica, Hyacinthoides non-scripta* and *Digitalis purpurea* (see target notes for local variations).

The low-lying areas are superficially dominated by *Juncus effusus* pasture although condition underfoot (and the flora) do not appear to be very marshy, perhaps impacted by the recent drainage. The only really wet marsh occur in the extreme south. However *Juncus effusus* is dominant through large areas with fairly similar associates: *Ranunculus repens, Galium palustre Epilobium spp., Cardamine pratensis, Cirsium palustre* and curiously there are frequent ferns (*Dryopteris filix-mas, D. dilatata, D. carthusiana* and *Athyrium filix-femina*); the bryophyte layer includes Calliergonella cuspidata, Rhytidiadelphus squarrosus, Eurhynchium praelongum and again somewhat unexpected some patches of Polytrichum commune, but in general indicating eutrophic ground conditions rather than acidic.

The rushy areas are interspersed with improved wet pasture islands (some large) where *Holcus lanatus, Agrostis capillaris, Lolium perenne, Cynosurus cristatus* plus *Ranunculus repens, Cerastium fontanum* and *Trifolium repens* occur, although this frequently intergrades with the rush pasture often with wet tufted hair-grass pasture (often with nettle and docken, again reflecting enrichment and past disturbance).

NVC: W10/11; W23, W25/U20; U4; MG10; MG9; MG6; M23b

Species: Umbilicus rupestris, Dryopteris carthusiana.

AWI
Two areas on Campbelton Hill are listed in the Ancient Woodland Inventory as 'Long-established (of plantation origin)'.

Comment
The site is a mixed one with two widely differing habitats. The hill supports some areas of acidic woodland, and although with limited floras (perhaps due to past grazing pressure?) there is a semi-natural atmosphere and some examples of bluebell woodland survive. The central area (grassland) has lost interest due to the spread of the bracken, but it could ultimately develop into woodland.

The low-lying pasture appears to be of limited botanical or habitat interest, due to the recent (and past) drainage. Although dominated by *Juncus effusus* the associate ground cover is limited and is not particularly marshy. The presence of a number of ferns is unexpected, including *Dryopteris carthusiana*, which with the moss *Polytrichum commune*, could represent past acidic mire conditions? The pasture extends further north than the previous survey boundary indicates (formerly 'improved') but the 'wet inundation' grassland in the south does not differ from the other adjacent pasture. A few wet marshy areas may occur in the sea of rush but none were detected apart from those noted in the extreme south.

Target Notes

1a	19417	50875	Rushy pasture dominated by Juncus effusus but with a not particularly rich marshy flora; herbs include Ranunculus repens, Galium palustre, Epilobium spp., Cardamine pratensis and Cirsium palustre. See also 1b.
1b	19427	50875	There are several ferns: Dryopteris filix-mas, D. dilatata, D. carthusiana and Athyrium filix-femina. Mosses include Calliergonella cuspidata, Rhytidiadelphus squarrosus and some patches of Polytrichum commune.
2	19465	50824	Recently cleared broad and deep ditch (to 2m deep) with dredged Oenanthe, Equisetum fluviatile, Sparganium erectum, Veronica beccabunga, Epilobium hirsutum, Agrostis stolonifera etc.
3	19415	50824	Large stand of Equisetum fluviatile 'swamp' near to the ditch; with similar associates to the Juncus pasture.
4a	19518	50705	Extensive area of Juncus effusus rush pasture with Deschampsia cespitosa, J. acutiflorus, Holcus lanatus, Agrostis stolonifera, plus herbs. See 4b for additional species present.
4b	19526	50705	Additional species are Ranunculus repens, Galium palustre Epilobium spp., Cirsium palustre, Rumex obtusifolius, Urtica dioica and Cirsium arvense and with frequent ferns (Dryopteris filix-mas, D. dilatata, D. carthusiana and Athyrium filix-femina).
5	19435	50726	Central ridge of improved, freer-draining pasture (Hl, Agrostis capillaris, Lolium perenne, Cynosurus cristatus plus Ranunculus repens, Cerastium fontanum and Trifolium repens); grading to the Juncus/Deschampsia pasture (with nettle, docken etc.).
6	19606	50736	Large drain recently cleared with much Equisetum fluviatile; pasture mainly improved but with gradation to the Juncus/Deschampsia areas.
7a	19591	50628	Central area mainly dominated by soft rush pasture with some areas of more open improved pasture. Je with Dc, Ja, Hl, plus herbs Rr, Rumex acetosa, Galium palustre, Ep, Cp, Rumex obtusifolius, Urtica dioica and Senecio jacobaea.
7b	19599	50628	There is a moss layer with Calliergonella cuspidata, Eurhynchium praelongum, Rhytidiadelphus squarrosus, Lophocolea bidentata and some Polytrichum commune.
8	19416	50562	Broad and deep drain by the fence recently cleared (Equisetum fluviatile, Eleocharis palustris, Agrostis stolonifera).

9	19323	50415	Pasture as in the north with local areas of improved open grass (Lolium, Holcus, Cynosurus, Ranunculus repens) grading to rushy Juncus/Deschampsia areas.
10a	19423	50403	Wetter southern edge of pasture much wetter (but otherwise appearing similar) with towards the recently dredged drain (and ponds) much Oenanthe crocata joining the Juncus effusus; see 10b for associated species.
10b	19423	50403	Associates include Galium palustre, Epilobium palustre, E. hirsutum, Iris pseudacorus, Angelica sylvestris, Mentha aquatica etc.
11	19221	50283	Southern end of the drain with a relic pool supporting Potamogeton natans, P. berchtoldii, Lemna minor and Callitriche sp.
12a	19093	50540	South-eastern edge of hill with woodland and bracken on a steep embankment; the canopy with sycamore, frequent oak (gnarled) and some larch and rowan; ground cover with much bracken with bramble, or Dryopteris dilatata. See also 12b.
12b	19102	50540	There are some grassy areas (Holcus, Agrostis, Anthoxanthum, Deschampsia flexuosa, Galium saxatile) plus frequent Oxalis acetosella and occasional Hyacinthoides non-scripta, Luzula pilosa, Silene dioica and Digitalis purpurea.
13	19155	51017	Small gully with rock faces (old quarry?) with much shading sycamore over some moss and ferns.
14	19235	51017	Northern edge with dense stands of gorse (amid or below the bracken) with some rowan, willow and sycamore emerging.
15a	19008	50996	Northern end of the west side woodland with a canopy of sycamore plus some oak, ash, elm and larch (the latter above) over a mostly grassy ground flora (stock access) with Holcus, Agrostis and Ranunculus repens. Herbs are limited (see 15b for details).
15b	19016	50996	Limited herbs are Viola riviniana, Veronica chamaedrys, Oxalis acetosella, Silene dioica, Urtica dioica, rare Hyacinthoides non-scripta and local Dryopteris dilatata.
16	18992	50924	Rock outcrop with polypody and ivy and some shaded Umbilicus.
17	19059	50924	Summit ridge (very hard to access) with stands of gorse and bramble (rare rowan) in a sea of somewhat windswept and scorched bracken; associates seem limited (local Silene, Digitalis, Rubus spp.)
18	18973	50855	Southern end of woodland similar to that in the north with canopy of sycamore plus ash, elm, local larch, and some beech below; ground cover grassy (some Veronica, Viola and Silene) with increasing bracken in the

			south.
19	18951	50845	Recently cleared area of pylon work; also new track extends around edge of woodland.

Species List from 2015 survey

Taxon	Common name
Acer pseudoplatanus	Sycamore
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Alopecurus geniculatus	Marsh Foxtail
Angelica sylvestris	Wild Angelica
Anthoxanthum odoratum	Sweet Vernal-grass
Arrhenatherum elatius	False Oat-Grass
Athyrium filix-femina	Lady-fern
Callitriche stagnalis sens. lat.	Common Water-starwort
Cardamine pratensis	Cuckooflower
Carex leporina	Oval Sedge
Cerastium fontanum	Common Mouse-ear
Chamerion angustifolium	Rosebay Willowherb
Cirsium arvense	Creeping Thistle
Cirsium palustre	Marsh Thistle
Cirsium vulgare	Spear Thistle
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Cynosurus cristatus	Crested Dog's-tail
Deschampsia cespitosa	Tufted Hair-grass
Deschampsia flexuosa	Wavy Hair-grass
Digitalis purpurea	Foxglove
Dryopteris carthusiana	Narrow Buckler-Fern
Dryopteris dilatata	Broad Buckler-fern
Dryopteris filix-mas	Male-fern
Eleocharis palustris	Common Spike-rush
Elytrigia repens agg.	0
Epilobium hirsutum	Great Willowherb
Epilobium obscurum	Short-fruited Willowherb
Epilobium palustre	Marsh Willowherb
Equisetum fluviatile	Water Horsetail
Fagus sylvatica	Beech
Fraxinus excelsior	Ash
Galeopsis bifida	Bifid Hemp-nettle
Galium aparine	Cleavers
Galium palustre	Marsh-bedstraw
Galium saxatile	Heath Bedstraw

Geranium robertianum	Herb-Robert
Glyceria fluitans	Floating Sweet-grass
Hedera helix	Common Ivy
Holcus lanatus	Yorkshire-fog
Holcus mollis	Creeping Soft-grass
Hyacinthoides non-scripta	Bluebell
Hypochaeris radicata	Cat's-ear
Ilex aquifolium	Holly
Iris pseudacorus	Yellow Iris
Juncus acutiflorus	Sharp-flowered Rush
Juncus articulatus	Jointed Rush
Juncus effusus	Soft-rush
Larix decidua	European Larch
Lemna minor	Common Duckweed
Lolium perenne	Perennial Rye-grass
Lotus pedunculatus	Greater Bird's-foot-trefoil
Luzula pilosa	Hairy Wood-rush
Mentha aquatica	Water Mint
Myosotis laxa	Tufted Forget-me-not
Nasturtium officinale agg.	Water-cress
Oenanthe crocata	Hemlock Water-dropwort
Oxalis acetosella	Wood-sorrel
Phleum pratense	Timothy
Poa humilis	Spreading Meadow-grass
Poa trivialis	Rough Meadow-grass
Polypodium vulgare	Polypody
Prunus spinosa	Blackthorn
Pteridium aquilinum	Bracken
Quercus robur	Pedunculate Oak
Rhinanthus minor	Yellow-rattle
Rhododendron ponticum	Rhododendron
Rubus fruticosus agg.	Bramble
Rubus idaeus	Raspberry
Salix cinerea subsp. oleifolia	Rusty Willow
Silene dioica	Red Campion
Sorbus aucuparia	Rowan
Stellaria media	Common Chickweed
Ulex europaeus	Gorse
Ulmus glabra	Wych Elm
Umbilicus rupestris	Navelwort
Urtica dioica	Common Nettle
Veronica chamaedrys	Germander Speedwell
Viola riviniana	Common Dog-violet

Species Total: 80

Invertebrates

Gill Smart 1999: incidental records from survey of combined site survey of 'Hunterston to Portencross and Goldenberry Hill': Blue Damselfly, Red Damselfly, Darter Dragonfly, Water Beetles, Ants, Meadow Brown Butterfly, Grasshoppers, Six-spot Burnet Moth

Amphibians

Gill Smart 1999: incidental records from survey of combined site survey of 'Hunterston to Portencross and Goldenberry Hill': Common Frog

Birds

Gill Smart 1999: incidental records from survey of combined site survey of 'Hunterston to Portencross and Goldenberry Hill': Blackbird, Bullfinch, Buzzard, Carrion Crow, Chaffinch, Curlew, Goldfinch, Grey Wagtail, Grey Heron, Mallard, Moorhen, Pheasant, Gulls, Skylark, Song Thrush, Swallow, Treecreeper, Wren

Liz Parsons, Starling Learning 1992 to 1996 (resident at Hunterston Estate):

Species
Barn Owl *Tyto alba*
Blackbird *Turdus merula*
Blackcap *Sylvia atricapilla*
Black-headed Gull *Larus ridibundus*
Blue Tit *Cyanistes caeruleus*
Bullfinch *Pyrrhula pyrrhula*
Buzzard *Buteo buteo*
Carrion Crow *Corvus corone*
Chaffinch *Fringilla coelebs*
Chiffchaff *Phylloscopus collybita*
Coal Tit *Periparus ater*
Common Gull *Larus canus*
Curlew *Numenius arquata*
Dunnock *Prunella modularis*
Fieldfare *Turdus pilaris*
Goldcrest *Regulus regulus*
Goldfinch *Carduelis carduelis*
Grasshopper Warbler *Locustella naevia*
Great Black-backed Gull *Larus marinus*
Great Tit *Parus major*
Greenfinch *Carduelis chloris*
Grey Heron *Ardea cinerea*

Greylag Goose *Anser anser*
Herring Gull *Larus argentatus*
House Martin *Delichon urbica*
Jackdaw *Corvus monedula*
Kestrel *Falco tinnunculus*
Lapwing *Vanellus vanellus*
Lesser Black-backed Gull *Larus fuscus*
Lesser Redpoll *Carduelis cabaret*
Linnet *Carduelis cannabina*
Long-tailed Tit *Aegithalos caudatus*
Magpie *Pica pica*
Mallard *Anas platyrhynchos*
Meadow Pipit *Anthus pratensis*
Mistle Thrush *Turdus viscivorus*
Oystercatcher *Haematopus ostralegus*
Pheasant *Phasianus colchicus*
Pied Wagtail *Motacilla alba*
Redwing *Turdus iliacus*
Reed Bunting *Emberiza schoeniclus*
Robin *Erithacus rubecula*
Rook *Corvus frugilegus*
Sedge Warbler *Acrocephalus schoenobaenus*
Siskin *Carduelis spinus*
Skylark *Alauda arvensis*
Snipe *Gallinago gallinago*
Song Thrush *Turdus philomelos*
Sparrowhawk *Accipiter nisus*
Spotted Flycatcher *Muscicapa striata*
Starling *Sturnus vulgaris*
Stock Dove *Columba oenas*
Stonechat *Saxicola rubicola*
Swallow *Hirundo rustica*
Swift *Apus apus*
Tawny Owl *Strix aluco*
Treecreeper *Certhia familiaris*
Whitethroat *Sylvia communis*
Willow Warbler *Phylloscopus trochilus*
Woodcock *Scolopax rusticola*
Woodpigeon *Columba palumbus*
Wren *Troglodytes troglodytes*

Species total: 62

Schedule 1 bird species: Barn Owl

Red listed breeding birds:
Lapwing, Woodcock, Skylark, Grasshopper Warbler, Song Thrush, Mistle Thrush, Spotted Flycatcher, Linnet.

Non breeding Red Listed species
Herring Gull, Starling, Fieldfare, Redwing, Curlew, Lesser Redpoll.

Amber listed birds:
Mute Swan, Greylag Goose, Mallard, Snipe, Black-headed Gull, Common Gull, Lesser Black-backed Gull, Great Black-backed Gull, Tawny Owl, Kestrel, House Martin, Willow Warbler, Dunnock, Meadow Pipit, Bullfinch, Reed Bunting.

Mammals

Gill Smart 1999: incidental records from survey of combined site survey of 'Hunterston to Portencross and Goldenberry Hill': Fox (field signs), Rabbit, Brown Hare (3), Shrew (heard)

Liz Parsons, Starling Learning 1992 to 1996 (resident at Hunterston Estate):
Nationally rare/scarce mammals (Schedule 5 of Wildlife & Countryside Act 1981): Common Pipistrelle *Pipistrellus pipistrellus, Soprano* Pipistrelle *Pipistrellus pygmaeus*

Miscellaneous
It is about 1km from Southannan Sands and Portencross Woods Sites of Special Scientific Interest (SSSI).
Residents from Hunterston Estate and other walkers use the site.
It is adjacent to the Goldenberry Hill LNCSs.

Site name: Goldenberry Hill
Site number: 119
Date: 2nd September 2015

Introduction
The site is a hilly ridge (northern half) situated between the coastal Bankhead cliff woods and Campbelton Hill, and to the south of the Hunterston development (which is extending closer). The site was surveyed in 1999 by Gill Smart (SWT) and conditions appear quite similar although there has been a dramatic spread of scrub in the west and south, often to the detriment of relic heathland (hard to access though). Stock have access throughout but mostly to the central hill and southern woodland areas (discouraged elsewhere by dense scrub and some old walls).

A species list, habitat map and set of target notes are provided.

Vegetation
There are three main old plantation areas, but with semi-natural conditions, and with similar canopies: relic pine and larch occur but the canopy is mostly sycamore with beech plus local birch (often as dense regeneration), oak (some *Q. petraea*) and rowan. The ground cover is acidic with typically acidic grasses (especially where grazed) but more usually with bracken (some in open glades), *Dryopteris dilatata* where shaded, plus grasses (*Holcus mollis, Agrostis capillaris, Anthoxanthum odoratum, Deschampsia flexuosa*) and herbs such as *Oxalis acetosella, Hyacinthoides non-scripta, Silene dioica, Viola riviniana* and local *Luzula sylvatica* and *Lonicera periclymenum* (see target notes for local variations).

There appears to have been much spread of birch and gorse (and bracken – although some of this also lost to scrub) since the 1999 survey but there are areas of open acidic grassland and heath persisting.

The heathland is of note and includes one area of diverse wet heath with *Molinia caerulea* plus *Erica tetralix, Calluna vulgaris, Trichophorum cespitosum (germanicum), Vaccinium myrtillus, Sphagnum spp., Pleurozium schreberi, Aulacomnium palustre, Polytrichum commune* and *Leucobryum glaucum*. Dry heath is present on steeper slopes (mainly in the southwest) and can inter-grade with the more strongly acidic grassland relics (indicated by *Carex binervis, Juncus squarrosus, Festuca ovina, Nardus stricta, Agrostis vinealis* and *Pedicularis sylvatica*). Other grassland is of the bent-fescue type, some slightly improved or enriched. There is very little in the way of marsh vegetation.

NVC: W10/11, W4; W23, W25/U20; M15, H10/12, U4, U5, MG6

Significant Species: *Erica cinerea, Trichophorum cespitosum (germanicum), Pedicularis sylvatica, Quercus petraea, Lysimachia nemorum, Leucobryum glaucum*

AWI
Some parts of the site are listed in the Ancient Woodland Inventory as both 'Ancient (of semi-natural origin)', along the western cliffs and 'Long-established (of plantation origin)', on the northern and eastern slopes of Goldenberry Hill.

Comment

The area supports a good mosaic of acidic habitats ranging from oak and birch type woodlands, to open areas of dry and wet heath, with some acidic grasslands.

Target Notes

1	18713	50937	Fenced off rocky ridge with beech (and some sycamore) over acidic grassland.
2	18680	50804	Plantation with pine, larch, sycamore and beech plus birch, oak (some Q. petraea) and rowan; ground cover with much bracken (some glades), Dryopteris dilatata where shaded, plus grasses (Holcus, Agrostis, Anthoxanthum, Deschampsia flexuosa) and Oxalis acetosella, Hyacinthoides non-scripta, Silene dioica, Teucrium scorodonia and Lonicera periclymenum.
3	18676	50765	Scrubby woodland slope with some bracken glades but also much birch regeneration (some pendulous) plus rowan.
4	18602	50744	Slope with open immature birch woodland (some rowan, beech and pine) over a short (grazed) grassy ground flora – some Oxalis and occasional Molinia.
5	18490	50655	Small shaded valley in birch woodland of mostly acidic grassland – Vaccinium, Deschampsia flexuosa and Galium saxatile, and some grazed ferns.
6	18509	50613	Sloping open ground with wet heath (some shaded below) with Molinia plus Erica tetralix, Calluna vulgaris, Vaccinium myrtillus, Sphagnum capillifolium, Pleurozium schreberi, Polytrichum commune etc.; above are some dry heathy ridges (Calluna – Cladonia frequent) and then a leveller area of wetter heath (similar species to below plus Trichophorum, Sphagnum palustre and Leucobryum glaucum).
7	18478	50510	Dry heath on steeper slopes but also much acidic grassland and increasing gorse scrub: Calluna, Erica cinerea, Vaccinium myrtillus, Carex binervis, Agrostis vinealis, Galium saxatile etc.
8	18455	50471	Extensive area of undulating, rising ground with somewhat improved bent-fescue pasture (Holcus lanatus, Agrostis capillaris, Rumex acetosa, Potentilla erecta) but with dense or spreading gorse, also some very local Juncus effusus flushes, and relic heathy areas (appear rare now due to scrub spread?).
9	18536	50457	Dense young birch, over suppressed grasses, between the plantation and stands of gorse and bracken.
10	18547	50447	Southern end of the plantation with canopy of sycamore, beech and larch (rare oak, birch and rowan) over much Dryopteris dilatata, local bracken, plus some acidic grass and occasional Hyacinthoides non-scripta.
11	18528	50338	Open former plantation area (scattered pine, larch, beech, sycamore, birch and rowan) with gorse and bramble, but much open improved grassland, often wet and poached (cattle).
12	18399	50293	Southern slope with dense bracken below, slightly more open above with relic acid grassland (and gorse at the crest)
13	18315	50318	Summit ridge with strongly acidic grass, and some heath elements (Nardus

			plus Carex binervis, Calluna, Vaccinium, Juncus squarrosus, Deschampsia flexuosa)
14	18750	50376	Western half of the summit slope with grazed relic heath (mostly dry, but with some acidic grassland areas) but also with dense and spreading (and threatening) gorse: species include Calluna, Vaccinium, Erica cinerea, Carex binervis, Festuca ovina, Nardus stricta, Agrostis vinealis and Pedicularis sylvatica.
15	18142	50451	Western end of the plantation with sycamore, beech, oak, larch, birch and rowan; over Dryopteris dilatata, sparse grass, some Oxalis but often shaded and bare.
16	18081	50460	Steepening slope with immature birch (some rowan and beech) over mostly Dryopteris dilatata and Luzula sylvatica with local Vaccinium and Lonicera.
17	18052	50478	Broad valley with some bracken stands but cover mostly of immature birch and suppressed gorse over scattered Luzula sylvatica and Dryopteris dilatata, with Vaccinium myrtillus and acid grassland elements.
18	17981	50460	Small relic areas of dry heath near the old wall but hard to access due to the impenetrable dense gorse (and immature birch).
19	17946	50473	Open heath glade on the slope (Calluna, Vaccinium, Erica cinerea) with some Luzula sylvatica stands, and encroaching gorse and birch.
20	17897	50467	Young birch over Luzula sylvatica; bracken dense and extending further below to the west.
21	18095	50609	Scrubby complex mosaic area of bracken, gorse, birch and some hawthorn, with Juncus stands and much male fern.
22	18000	50750	Hawking Craig plantation with canopy of mostly sycamore plus ash, pine, larch, oak and rowan; over bracken, Dryopteris dilatata, Oxalis, Holcus mollis, Silene dioica, Luzula sylvatica and Hyacinthoides non-scripta.
23	18212	50600	Southern slope plantation with sycamore, beech, larch, elm and oak (some sessile); grazed and often sparse ground flora cover: Dryopteris ferns, Oxalis, Viola riviniana, Lonicera and occasional Hyacinthoides. Immature birch above.
22	18395	50699	Mixed area on the southern edge with scattered trees (grazed) and bracken; pasture with a small marshy flush (Juncus acutiflorus, Lotus pedunculatus, Ranunculus flammula, Cirsium palustre and some Lysimachia nemorum).
23	18546	50748	Semi-circular wood on low ridge with much sycamore plus ash, oak, birch, rowan and beech but also some bracken glades and shaded acid grassland (some Oxalis, Viola) – grazed.

Species List from 2015 visit

Taxon	Common name
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Agrostis canina	Velvet Bent
Agrostis vinealis	Brown Bent
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Anthoxanthum odoratum	Sweet Vernal-grass
Arrhenatherum elatius	False Oat-Grass
Athyrium filix-femina	Lady-fern
Betula pendula	Silver Birch
Betula pubescens	Downy Birch
Calluna vulgaris	Heather
Carex binervis	Green-ribbed Sedge
Cirsium palustre	Marsh Thistle
Crataegus monogyna	Hawthorn
Deschampsia cespitosa	Tufted Hair-grass
Deschampsia flexuosa	Wavy Hair-grass
Dryopteris dilatata	Broad Buckler-fern
Dryopteris filix-mas	Male-fern
Erica cinerea	Bell Heather
Erica tetralix	Cross-leaved Heath
Fagus sylvatica	Beech
Festuca ovina agg.	Sheep's-fescue
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Galium saxatile	Heath Bedstraw
Holcus lanatus	Yorkshire-fog
Holcus mollis	Creeping Soft-grass
Hyacinthoides non-scripta	Bluebell
Ilex aquifolium	Holly
Juncus acutiflorus	Sharp-flowered Rush
Juncus conglomeratus	Compact Rush
Juncus effusus	Soft-rush
Juncus squarrosus	Heath Rush
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle
Lotus pedunculatus	Greater Bird's-foot-trefoil
Luzula pilosa	Hairy Wood-rush
Luzula sylvatica	Great Wood-rush
Lysimachia nemorum	Yellow Pimpernel
Molinia caerulea	Purple Moor-grass
Nardus stricta	Mat-grass
Oxalis acetosella	Wood-sorrel
Pedicularis sylvatica	Lousewort

Potentilla erecta	Tormentil
Pteridium aquilinum	Bracken
Quercus petraea	Sessile Oak
Quercus robur	Pedunculate Oak
Ranunculus flammula	Lesser Spearwort
Rubus fruticosus agg.	Bramble
Rumex acetosa	Common Sorrel
Rumex acetosella	Sheep's Sorrel
Sambucus nigra	Elder
Silene dioica	Red Campion
Sorbus aucuparia	Rowan
Teucrium scorodonia	Wood Sage
Trichophorum germanicum	Deergrass
Ulex europaeus	Gorse
Ulmus glabra	Wych Elm
Vaccinium myrtillus	Bilberry
Veronica chamaedrys	Germander Speedwell
Viola riviniana	Common Dog-violet
Larix decidua	European Larch
Pinus sylvestris	Scots Pine

Species Total: 66

Invertebrates

Gill Smart 1999: incidental records from survey of combined site survey of 'Hunterston to Portencross and Goldenberry Hill': Blue Damselfly, Red Damselfly, Darter Dragonfly, Water Beetles, Ants, Meadow Brown Butterfly, Grasshoppers, Six-spot Burnet Moth

Amphibians

Gill Smart 1999: incidental records from survey of combined site survey of 'Hunterston to Portencross and Goldenberry Hill': Common Frog

Birds

Gill Smart 1999: incidental records from survey of combined site survey of 'Hunterston to Portencross and Goldenberry Hill': Blackbird, Bullfinch, Buzzard, Carrion Crow, Chaffinch, Curlew, Goldfinch, Grey Wagtail, Grey Heron, Mallard, Moorhen, Pheasant, Gulls, Skylark, Song Thrush, Swallow, Treecreeper, Wren

Liz Parsons, Starling Learning 1992 to 1996 (resident at Hunterston Estate):

Species
Barn Owl *Tyto alba*
Blackbird *Turdus merula*
Blackcap *Sylvia atricapilla*
Black-headed Gull *Larus ridibundus*
Blue Tit *Cyanistes caeruleus*
Bullfinch *Pyrrhula pyrrhula*
Buzzard *Buteo buteo*
Carrion Crow *Corvus corone*
Chaffinch *Fringilla coelebs*
Chiffchaff *Phylloscopus collybita*
Coal Tit *Periparus ater*
Common Gull *Larus canus*
Curlew *Numenius arquata*
Dunnock *Prunella modularis*
Fieldfare *Turdus pilaris*
Goldcrest *Regulus regulus*
Goldfinch *Carduelis carduelis*
Grasshopper Warbler *Locustella naevia*
Great Black-backed Gull *Larus marinus*
Great Tit *Parus major*
Greenfinch *Carduelis chloris*
Grey Heron *Ardea cinerea*
Greylag Goose *Anser anser*
Herring Gull *Larus argentatus*
House Martin *Delichon urbica*
Jackdaw *Corvus monedula*
Kestrel *Falco tinnunculus*
Lapwing *Vanellus vanellus*
Lesser Black-backed Gull *Larus fuscus*
Lesser Redpoll *Carduelis cabaret*
Linnet *Carduelis cannabina*
Long-tailed Tit *Aegithalos caudatus*
Magpie *Pica pica*
Mallard *Anas platyrhynchos*
Meadow Pipit *Anthus pratensis*
Mistle Thrush *Turdus viscivorus*
Oystercatcher *Haematopus ostralegus*
Pheasant *Phasianus colchicus*
Pied Wagtail *Motacilla alba*

Redwing *Turdus iliacus*
Reed Bunting *Emberiza schoeniclus*
Robin *Erithacus rubecula*
Rook *Corvus frugilegus*
Sedge Warbler *Acrocephalus schoenobaenus*
Siskin *Carduelis spinus*
Skylark *Alauda arvensis*
Snipe *Gallinago gallinago*
Song Thrush *Turdus philomelos*
Sparrowhawk *Accipiter nisus*
Spotted Flycatcher *Muscicapa striata*
Starling *Sturnus vulgaris*
Stock Dove *Columba oenas*
Stonechat *Saxicola rubicola*
Swallow *Hirundo rustica*
Swift *Apus apus*
Tawny Owl *Strix aluco*
Treecreeper *Certhia familiaris*
Whitethroat *Sylvia communis*
Willow Warbler *Phylloscopus trochilus*
Woodcock *Scolopax rusticola*
Woodpigeon *Columba palumbus*
Wren *Troglodytes troglodytes*

Species total: 63

Schedule 1 bird species: Barn Owl

Red listed breeding birds:
Lapwing, Woodcock, Skylark, Grasshopper Warbler, Song Thrush, Mistle Thrush, Spotted Flycatcher, Linnet.

Non breeding Red Listed species
Herring Gull, Starling, Fieldfare, Redwing, Curlew, Lesser Redpoll.

Amber listed birds:
Mute Swan, Greylag Goose, Mallard, Snipe, Black-headed Gull, Common Gull, Lesser Black-backed Gull, Great Black-backed Gull, Tawny Owl, Kestrel, House Martin, Willow Warbler, Dunnock, Meadow Pipit, Bullfinch, Reed Bunting.

Mammals

Gill Smart 1999: incidental records from survey of combined site survey of 'Hunterston to Portencross and Goldenberry Hill': Fox (field signs), Rabbit, Brown Hare (3), Shrew (heard)

Liz Parsons, Starling Learning 1992 to 1996 (resident at Hunterston Estate):
Nationally rare/scarce mammals (Schedule 5 of Wildlife & Countryside Act 1981): Common Pipistrelle *Pipistrellus pipistrellus, Soprano* Pipistrelle *Pipistrellus pygmaeus*

Miscellaneous
It is adjacent to Portencross Woods Site of Special Scientific Interest (SSSI)
Residents from Hunterston Estate and other walkers use the site.
It is very close to the Campbelton Hill & Watermeadow LNCS.

Site name: Glen Burn (Crosbie to North Southannan) – west section (lowland)
Site number: 121
Date of survey: 11th November 2015

The site is now simply known as Crosbie to Southannan.

Introduction
This site is large and unwieldly, combining large tracts of moorland with a mosaic of more lowland habitat types. This report is concerned with the latter. It was visited to decide on a boundary between the lowland and upland areas (with a view to splitting the site in two) as well as examining the habitats, in particular several woodlands that extend down to the railway and road along the coast.

Some parts of the site were previously investigated in surveys by Paul, Sargent et al (1982 and various undated visits) and Ramirez and Barr 1999. After the survey by Ramirez and Barr a new site Crosbie Wood (including the other two areas they visited (Dykes Plantation and Crosbie Reservoir) was created out of their surveyed area. This can now be re-incorporated into the larger site since permission to survey that was obtainable this time, in 2015.

Relevant results from 1982 and 1999 are referred to below.

Examination of aerial images (confirmed from ground visits) shows several areas of improved grassland are included within the original boundary, and many of the woodland blocks are planted with conifers. Some of the latter now include semi-natural regeneration, but there are some relics of old woodland.

Target note are provided for most of the areas along this western boundary.

Comment
It considered that the 'upland site' boundary could follow (in the northern half) the old wall below the steeper hillside slopes (i.e. from above Southannan Glen, below Black Hill, south to Glenside Wood). The boundary could cross the moor road at the top of 'The Glen' (although the latter can be incorporated) and continue to Biglees Hill and the disused quarry; Kilruskin Glen could be included in the boundary here.

In the south the boundary should include the uplands of Glentane Hill from the southern end of Glenburn Reservoir to Crosbie Dykes, above Crosbie Wood.

It is unclear why the present site boundary excludes Lairdside Hill, and the southern sections of Cauldron Hull and Crosbie Hills; these should be incorporated south to Glenton Hill and Gill Hill.

Several woodland areas along the former western boundary are awkward to include within this upland boundary due to the intervening improved grassland areas. Most of these woodlands could stand on their own merits, but alternatively, and more logically, they could be incorporated within a new separate Glen Burn site to also accommodate various scrubby braes and relic mires within much the recently improved areas:

Southannan Glen: supports a good range of old woodland species ranging from wet and acidic types in the north to valley types in the south; the cliff embankments, along the railway, listed in the Ancient Woodland Inventory (AWI) as 'Long established (of plantation origin)', should be included as extensions here (as depicted in original boundary). Dave Lang (BSBI) provided a record of wood millet *Milium effusum* for Southannan Glen, locally rare.

Allan Woods: this is mostly conifer plantation but includes an area of very rich old alder woodland; some wet woodland occurs by the road below, and some old woodland elements persist in the conifer planted areas (but seemingly not many). Allan Wood is listed in the AWI as being 'Ancient (of semi-natural origin). It is isolated from the uplands by strip of improved grassland. There is scrubby brae slope above and a small area of alder and willow woodland below Black Hill (this latter could be included within the upland boundary as contiguous). The alder woodland is small but very diverse, but the rhododendron infestation is of concern and weakens its case as a stand alone site.

Glenside Plantation: conifers but with some birch scrub and bracken. There appears to be little reason to include this area.

The Glen is a rich area of valley woodland in a steep-sided glen. The woodland is listed in the AWI as 'Ancient (of semi-natural origin). It becomes more acidic above and is shaded by conifer plantations above. It could stand alone but it is contiguous with the moorland about the reservoir and Biglees Hill, so could equally be absorbed in the larger site.

Kilruskin Glen: The glen has some valley woodland elements below (including old trees) but the species diversity appears limited, and above it become open with very dense scrub. The eastern part of the glen is listed in the AWI as 'Long established (of plantation origin)'. In isolation the woodland site would struggle, but it could be linked as spur to the edge of the disused quarry.

Dykes Plantation is listed in the AWI as 'Long established (of plantation origin)'. See target notes for description of different areas within the woodland. This area was included in the reduced survey of the 121 Glen Burn site in 1999 by Ramirez and Barr.

Crosbie Wood: the woodland is a good example of an oak – birch type woodland. The woodland is listed in the AWI as 'Ancient (of semi-natural origin). This area was included in the reduced survey of the 121 Glen Burn site in 1999 by Ramirez and Barr. It could stand alone or be easily linked to the uplands at Crosbie Dyke. Below through the caravan park the interest is unfortunately limited by heavy shade and rhododendron infestation. It does form a narrow habitat corridor flowing further south. The Avenue, included in the revised site boundary in 2012, supports old trees but is difficult to justify for inclusion as part of the upland site.

A digital map (Final Phase 1 project for 121a b c) showing the above proposed site has been made, incorporating the sets of target notes below. A species list for the whole new proposed lower-lying site is provided below and individual species lists for specific areas are on file.

Significant species (2015): Mercurialis perennis, Polystichum aculeatum and P. setiferum, Festuca gigantea, Milium effusum, Carex laevigata, C. sylvatica, Bromus ramosus, Primula vulgaris, Hyacinthoides non-scripta, Myrica gale

Rare species given by Paul and Sargent 1982 from a general survey apparently of mainly the lower woodland parts of the site (no map): Hymenophyllum tunbrigense, Carum verticillatum, Myrica gale, Chaerophyllum temulentum; (The Glen): Echium vulgaris, Polystichum setiferum, Thelypteris phegopteris

Rare species (Ramirez and Barr 1999): Ranunculus hederaceus, Quercus petraea, Littorella uniflora and Elodea canadensis

121a Southannan Glen

1	21058	54362	Very steep embankment parallel to (and above) the railway. The canopy with sycamore and ash plus some elm and elder over ferns, bramble and much Mercurialis perennis; associates include Urtica dioica, Stachys sylvatica, Silene dioica, Veronica montana, Bromus ramosus, Chrysosplenium oppositifolium, Phyllitis and Polystichum aculeatum and P. setiferum (hybrid?).
2	21072	54458	Access road crosses the steep embankment creating a slight barrier to the core glen woodlands further to the north but there is some patchy regeneration and much bracken, bramble and ferns providing continuity.
3	21104	54496	Steep sided glen with canopy of sycamore, ash, oak (Turkey), sweet chestnut, beech, plus elm, hazel, holly; ground cover with bramble, Mercurialis, Silene dioica, Stachys sylvatica, Festuca gigantea, ivy, ferns (some Polystichum aculeatum, polypody and Phyllitis) and diverse bryophytes in the shaded areas below.
4	21327	54520	Valley narrows above (track crosses) but some plantation to the margins create a wider woodland; Luzula sylvatica and ferns are common, with some Milium effusum; locally poorly draining.
5	21411	54485	Upper slopes of glen more acidic with larch and pine trees plus much beech and some oak; ground flora with Holcus mollis, Oxalis acetosella, Silene dioica, Lonicera, Blechnum spicant and Teucrium scorodonia; Luzula sylvatica, ferns and bryophytes below by the burn.
6	21533	54405	Shallow soils about rocky ridges at the top of the pasture slope supporting relatively less improved bent-fescue grassland – diverse waxcap fungi.
7	21562	54387	Burn flows below the scrubby (past felled) slope where some beech, birch and pine; quite acidic ground fora with Dryopteris dilatata, Luzula sylvatica, Oxalis acetosella and Blechnum spicant.
8	21606	54354	Felled plantation with scrubby cover of birch and willow with some spruce (self-seeded?); some relic old beech above where also bracken, gorse and bramble. The slope is poorly draining with ferns (some Oreopteris limbosperma), Lonicera periclymenum, Juncus effusus, Ranunculus repens and frequent Sphagnum and other mosses.
9	21656	54354	Strip of acid grass above the plantation but below a new plantation area up the eastern hillside (much young oak on acid grassland; locally frequent blaeberry).

10	21593	54096	Wet pasture (variously drained) with much Juncus acutiflorus with Holcus lanatus; some acid mire areas occur (with Sphagnum) but also Ranunculus repens, Cirsium palustre, Rumex acetosa and Lotus pedunculatus, but in general limited diversity.
11	21305	53827	Diamond Hill with mostly well improved grassland (Cynosurus, Lolium etc.) and little evidence of relic U4 species.
12	21336	53990	Steep brae slope with dense gorse plus some regeneration scrub, bracken and bramble patches.
13	21218	53809	Long brae slope with mosaic of bramble, gorse, bracken and acid grassland.
14	21266	53723	Mostly enriched and improved U4 pastures but with a good diversity of waxcap fungi.
15	21255	53538	Old dam with gorse and semi-improved grassland to the margins; mainly open water with a little Glyceria fluitans (some Ranunculus hederaceus noted).
16	21264	53168	Former plantation area (some relic pine and larch) with beech at the margins (also scrubby birch and hawthorn); bracken common with Oxalis, Digitalis and grasses.
17	21281	53101	Wet woodland below (and about the small burn) with alder and willow over Juncus effusus, Holcus lanatus, Ranunculus repens plus some Equisetum sylvaticum, Myosotis secunda, Callitriche stagnalis and local acidic indicators such as Carex nigra, Molinia and Sphagnum.
			ALLAN WOOD
18	21000	53009	Wet woodland with much alder (some old based) with Ranunculus repens, Deschampsia cespitosa, Chrysosplenium oppositifolium, Ajuga reptans, Cardamine amara, Carex remota, Carex laevigata, Mentha aquatica, Festuca gigantea and Iris pseudacorus.
19	20941	53110	To the north of the core wet woodland there is more birch, willow, sycamore and some larch, but also abundant rhododendron limiting access; the wet ground flora persists but there is also some Hyacinthoides non-scripta, Oxalis acetosella, Mercurialis perennis, Primula vulgaris, Silene dioica and Carex sylvatica.
20	20850	53191	Some old broad-leaves (oak, alder, and sycamore) persist in the conifer plantation (old burn course?) with a few ground flora relics (Mercurialis, Silene, Carex remota).
21	20748	52956	Spruce plantation with a few local patches of old woodland about water courses; the wet central ride with frequent Ajuga reptans and Carex laevigata. A more open canopy occurs to the south.
22	20804	52815	Alders about a small narrow burn section.
23	20659	52842	Southern edge of the plantation with alder, birch and sycamore; ground flora with Mercurialis, Ranunculus repens, Urtica dioica, Carex remota and Iris pseudacorus.

24	21265	52528	Area of birch scrub in the felled (Glenside) plantation on the hill side slope above the moor road; bracken, bramble, ferns, Digitalis and gorse are frequent; some rhododendron on the road side.

121b Glen Burn

1	20606	52721	Lower part of the glen with a canopy of ash, elm, sycamore and hazel with some beech and oak (more so above); the ground flora appears varied with Mercurialis perennis, Oxalis acetosella, ferns, Silene dioica, Stachys sylvatica, Allium ursinum, plus Veronica montana, Glechoma hederacea, Ajuga reptans, Milium effusum and Carex laevigata.
2	20794	52538	The valley broadens above with the canopy of oak, ash, beech, birch and hazel; the ground cover on upper slopes includes Oxalis, Hyacinthoides, Lonicera, Holcus mollis and ferns. The northern side is more open and scrubbier with much bracken plus hazel; the southern side is shaded and very steep (plenty ferns), with some conifers above.
3	20942	52365	The upper valley with semi-natural woodland mostly restricted to the immediate burn sides below with some oak, sycamore, beech and hazel; the ground cover is more acidic with grasses, Oxalis, Lonicera, Silene dioica, Dryopteris dilatata, Luzula sylvatica and Blechnum spicant.
4	21167	52341	Northern side of the valley with dense bracken plus gorse with scrubby birch, willow, ash and larch (planted?).
			DAM
5	21710	51984	Reservoir in setting of some heath, acid grass and patchy scrub (willow and gorse). Margins with limited emergents but locally stands of Eleocharis palustris, Equisetum fluviatile, Hippuris, Sparganium erectum plus open water with Elodea canadensis, Myriophyllum alterniflorum, Callitriche hamulata and Potamogeton natans.
6	21686	51868	Small boggy area with some Myrica gale plus Eriophorum vaginatum and Molinia with Sphagnum; further to the south Carex rostrata dominates (with some Angelica and Hydrocotyle associates).
7	21545	51698	Southern end of the reservoir with stands of Eleocharis palustris, Equisetum fluviatile and Carex rostrata plus much Potamogeton natans. Carex rostrata and Juncus acutiflorus mires extend to the wider margins.
			TO QUARRY AREA
8	21280	51598	Ridged field seemingly recently heavily improved with heavy grazing and manuring (contrasting with aerial image). Some wet areas (with rushes and some Molinia) persist to the margins.
9	21004	51583	Old dam with Juncus dominated cover plus much Glyceria fluitans (rare Sphagnum); semi-improved acid grass on the margins with occasional rowan and gorse.

10	21004	51583	Quarry edge with skeletal soils supporting gorse and much Erica cinerea (plus Teucrium scorodonia, Festuca ovina, Galium saxatile, Digitalis purpurea etc.); also diverse lichens (crustose and Cladonia) plus bryophytes on gravels or stones.
11	20969	51508	Quarry walls poorly colonised (some male ferns plus heathers and gorse); gravelly quarry floor with a sparse cover (short grazed) with short heathers, gorse, Teucrium and bryophytes but seemingly a limited flora (some Centaurium erythraea and Echium vulgare noted). Much clay pigeon shooting debris.
12	20995	51669	Area of open water with Juncus effusus and Glyceria fluitans; used for shooting.
			NORTH KILRUSKIN
13	20720	50951	Wooded burnside (dense gorse and bramble to the north side about the old track) with a canopy of alder, ash, sycamore, oak, hawthorn and holly (several trees quite old); the ground flora appears limited but with some Chrysosplenium oppositifolium, Carex remota, Silene dioica, Veronica chamaedrys, Oxalis acetosella, Luzula sylvatica, Lonicera periclymenum, Primula vulgaris, Viola riviniana, ivy and ferns. New woodland planting along the southern margin pasture.
14	20854	51043	Tree canopy ends upstream with dense gorse and willow regeneration (some young spruce).
15	21040	51720	Broad valley impossible to access due to very dense gorse (plus bramble and rosebay willowherb) – presumably felled plantation; some regeneration scrub of willow, birch and young spruce. New woodland planting on the north side (towards the quarry).

121c Crosbie

1	21874	50468	Crosbie reservoir with open water seemingly devoid of plant life (some moss to the stone edges); short improved grass on its very narrow margins.
			DYKES
2	21726	50695	Bracken dominated slope (with Digitalis, Holcus, Oxalis, Silene and occasional Juncus effusus); some marginal pine, beech and alder relics below, plus local birch regeneration.
3	21734	50745	Wet birch woodland strip on the upper slope (with Juncus effusus, Deschampsia cespitosa, Holcus and some Sphagnum); bracken dense above to the east where some relic pine at the plantation edge.
4	21695	50795	Canopy of sycamore with pine; grazed, short grassy ground cover with some Oxalis, Silene, Claytonia and rare fern.
5	21564	50896	Bracken slope but with much regeneration (birch plus beech and sycamore) and some relic pine and older beech and sycamore; ground cover of bracken with Oxalis, Dryopteris dilatata and Digitalis.

6	21524	50975	Sycamore, beech and birch canopy but with much windblow (moss covered); grazed acid grass with Oxalis and Dryopteris dilatata.
7	21490	51010	Small area of birch (and rowan) over short acid grass plus Oxalis and Dryopteris dilatata. Pine occurs above (to the east).
8	21485	50993	New planting to the western side of the plantation, on rushy or acid grassland (some Molinia), and a ridge with gorse (not visited). New woodland planting also at the northern edge of the plantation.
			CROSBIE
9	22088	50526	Upper shallow valley of burn with a more 'open' dense mosaic of bracken with bramble and gorse plus some scrubby birch, hazel, sycamore (difficult to access).
10	22062	50488	Burn sides with cover of beech, sycamore, ash with hazel, holly and some marginal blackthorn; ground flora with bramble, ferns, Luzula sylvatica, Oxalis acetosella, Silene dioica, Mercurialis perennis, Chrysosplenium oppositifolium and Lonicera periclymenum.
11	22098	50325	Broad, wooded eastern slope above the burn (crossed by a track loop). Fairly uniform, but diverse oak woodland (some old trees or bases) with much birch plus oak, hazel, holly and some beech and sycamore; Luzula sylvatica dominates many areas or bracken where more light, but associates are fairly frequent and include Oxalis acetosella, Hyacinthoides non-scripta, Silene dioica, Stellaria holostea, Holcus mollis, Lonicera periclymenum, Deschampsia cespitosa and Dryopteris ferns.
12	22097	50194	Embankment below the track (and above the caravans) with open scrubby cover: gorse, broom, bracken, bramble, Luzula and some regenerating trees (birch, willow, and alder).
13	22057	50277	Woodland on the slope between ten track loop with similar canopy to that above (more alder) and much Luzula sylvatica and ferns as ground cover.
14	22010	50247	Burn valley with a small duck pond. Woodland fairly diverse (alder, willow, hazel and some old trees, with Luzula and ferns etc.). Some exotics appearing with rhododendron, conifers, Japanese knotweed and Lysimachia punctata.
15	21903	50081	Burn through caravan park with play areas and larger duck pond (much rhododendron and Japanese knotweed).
16	21715	50063	Glen descends below (through) the caravan park in a shaded glen with a canopy of beech and sycamore over abundant rhododendron, plus ferns, ivy and moss. Ground flora not evident.
17	21576	49955	Burn narrows by the road with abundant rhododendron plus snowberry, cherry laurel and Japanese knotweed.
18	21411	49876	Avenue by the road with some mature trees (policy links – lime, sycamore, beech, Turkey oak – and scrub) over grass, nettle, various exotics but some woodland indicators occur (Mercurialis, Lonicera, ferns and ivy).

Species List from 2015

Taxon	Common name
Acer pseudoplatanus	Sycamore
Agrostis canina	Velvet Bent
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Agrostis vinealis	Brown Bent
Ajuga reptans	Bugle
Alnus glutinosa	Alder
Angelica sylvestris	Wild Angelica
Asplenium scolopendrium	Hart's-tongue
Athyrium filix-femina	Lady-fern
Betula pubescens	Downy Birch
Blechnum spicant	Hard-fern
Bromopsis ramosa	Hairy-brome
Callitriche brutia sens. lat.	0
Callitriche stagnalis sens. lat.	Common Water-starwort
Calluna vulgaris	Heather
Cardamine amara	Large Bitter-cress
Carex binervis	Green-ribbed Sedge
Carex laevigata	Smooth-stalked Sedge
Carex nigra	Common Sedge
Carex remota	Remote Sedge
Carex rostrata	Bottle Sedge
Carex sylvatica	Wood-sedge
Castanea sativa	Sweet Chestnut
Centaurea nigra	Common Knapweed
Centaurium erythraea	Common Centaury
Chamerion angustifolium	Rosebay Willowherb
Chrysosplenium oppositifolium	Opposite-leaved Golden-saxifrage
Cirsium palustre	Marsh Thistle
Claytonia sibirica	Pink Purslane
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Cynosurus cristatus	Crested Dog's-tail
Cytisus scoparius	Broom
Dactylis glomerata	Cock's-foot
Deschampsia cespitosa	Tufted Hair-grass
Deschampsia flexuosa	Wavy Hair-grass
Digitalis purpurea	Foxglove
Dryopteris affinis agg.	Scaly Male-fern
Dryopteris dilatata	Broad Buckler-fern
Dryopteris filix-mas	Male-fern
Echium vulgare	Viper's-bugloss
Eleocharis palustris	Common Spike-rush
Elodea canadensis	Canadian Waterweed
Epilobium brunnescens	New Zealand Willowherb

Equisetum fluviatile	Water Horsetail
Equisetum sylvaticum	Wood Horsetail
Erica cinerea	Bell Heather
Erica tetralix	Cross-leaved Heath
Eriophorum vaginatum	Hare's-tail Cottongrass
Fagus sylvatica	Beech
Fallopia japonica	Japanese Knotweed
Festuca ovina agg.	Sheep's-fescue
Fraxinus excelsior	Ash
Galium palustre	Marsh-bedstraw
Geranium robertianum	Herb-Robert
Geum urbanum	Wood Avens
Glechoma hederacea	Ground-ivy
Glyceria fluitans	Floating Sweet-grass
Hedera helix	Common Ivy
Hedera helix agg.	Ivy
Hippuris vulgaris	Mare's-tail
Holcus lanatus	Yorkshire-fog
Holcus mollis	Creeping Soft-grass
Hyacinthoides non-scripta	Bluebell
Hydrocotyle vulgaris	Marsh Pennywort
Ilex aquifolium	Holly
Iris pseudacorus	Yellow Iris
Juncus acutiflorus	Sharp-flowered Rush
Juncus effusus	Soft-rush
Juncus squarrosus	Heath Rush
Littorella uniflora	Shoreweed
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle
Lotus pedunculatus	Greater Bird's-foot-trefoil
Luzula pilosa	Hairy Wood-rush
Luzula sylvatica	Great Wood-rush
Lysimachia punctata	Dotted Loosestrife
Mentha aquatica	Water Mint
Mercurialis perennis	Dog's Mercury
Milium effusum	Wood Millet
Molinia caerulea	Purple Moor-grass
Myosotis secunda	Creeping Forget-me-not
Myriophyllum alterniflorum	Alternate Water-milfoil
Nardus stricta	Mat-grass
Oreopteris limbosperma	Lemon-scented Fern
Oxalis acetosella	Wood-sorrel
Polypodium vulgare sens. lat.	Polypody
Polystichum aculeatum	Hard Shield-fern
Polystichum setiferum	Soft Shield-fern
Potamogeton natans	Broad-leaved Pondweed
Potentilla erecta	Tormentil
Primula vulgaris	Primrose

Prunella vulgaris	Selfheal
Prunus laurocerasus	Cherry Laurel
Prunus spinosa	Blackthorn
Pteridium aquilinum	Bracken
Quercus cerris	Turkey Oak
Quercus robur	Pedunculate Oak
Ranunculus acris	Meadow Buttercup
Ranunculus hederaceus	Ivy-leaved Crowfoot
Ranunculus repens	Creeping Buttercup
Rhododendron ponticum	Rhododendron
Ribes rubrum	Red Currant
Rubus fruticosus agg.	Bramble
Rumex acetosa	Common Sorrel
Salix cinerea subsp. oleifolia	Rusty Willow
Sambucus nigra	Elder
Schedonorus giganteus	Giant Fescue
Silene dioica	Red Campion
Sorbus aucuparia	Rowan
Sparganium erectum	Branched Bur-reed
Stachys sylvatica	Hedge Woundwort
Stellaria holostea	Greater Stitchwort
Succisa pratensis	Devil's-bit Scabious
Symphoricarpos albus	Snowberry
Teucrium scorodonia	Wood Sage
Tolmiea menziesii	Pick-a-back-plant
Trifolium repens	White Clover
Ulex europaeus	Gorse
Ulmus glabra	Wych Elm
Urtica dioica	Common Nettle
Vaccinium myrtillus	Bilberry
Veronica beccabunga	Brooklime
Veronica chamaedrys	Germander Speedwell
Veronica montana	Wood Speedwell
Viola palustris	Marsh Violet
Viola riviniana	Common Dog-violet

Species Total: 128

Other wildlife given by Paul and Sargent (1982): Birds: Bullfinch, Wren, Meadow Pipit, Blackbird, Blue Tit, Willow Warbler, Pheasant (The Glen); Southannan Glen bird species along with Fairlie Glen bird species are declared to be important on a local scale for the diversity of the breeding community but no species are listed; **Mammals:** Rabbit, Brown Hare; **Insects:** Antler Moth; water beetles near Glenburn Reservoir: Hydroporus longulus, Agabus guttatus, Anacaena globulus, Limnebius trancatellus; Glenburn Reservoir: Large blue dragonfly (Common Hawker Dragonfly Aeschna juncea; **Reptiles**: Common Lizard; **Amphibians**: Frog, Toad (Glenburn Reservoir);

An unnamed bird surveyor recorded Dipper, Red Grouse and Buzzard in addition to the above species from Paul and Sargent, presumably around 1982

Ramirez and Barr 1999: Birds: Blackbird, Buzzard, Jackdaw, Raven, Robin, Woodpigeon and Wren; **Mammals:** field signs for' deer'

While the condition of the habitat suggests many of the birds listed could be present, the records are too old to be used for assessment purposes. The habitats and plants, however, were considered of sufficient quality to negate the need for a search for additional information.

Miscellaneous
No continuity with a Site of Special Scientific Interest (SSSI).
Not in ownership which has outstanding potential to achieve, through effective conservation management, LNCS quality.
Not used formally for environmental education.
Is used by the local community.
It is a wildlife corridor connected with the coast.

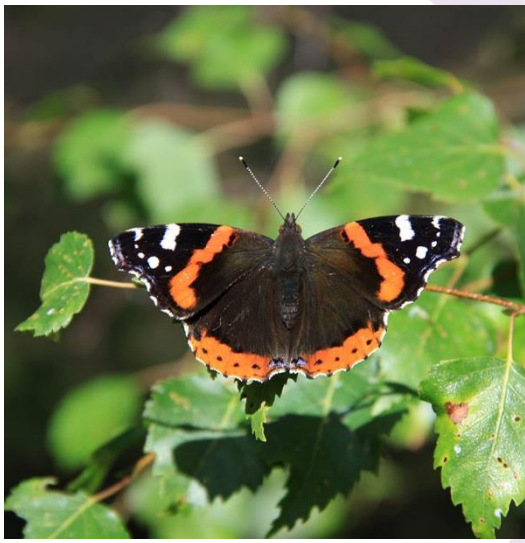
Appendix 7B.

Baseline Report: Phase 1 Habitat Survey

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Phase 1 Habitat Survey



Wood Environment & Infrastructure Solutions UK Limited – December 2019

Report for

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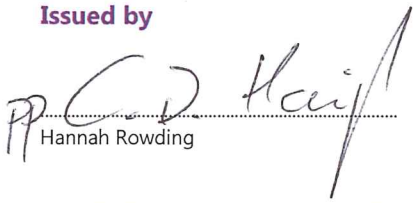

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Management systems

This document has been produced by Wood Environment & Infrastructure Solutions UK Limited in full compliance with the management systems, which have been certified to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA.

Document revisions

No.	Details	Date
1	Draft for client comment	October 2019
2	Final	December 2019

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy proposes to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B (HNB) to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under The Town and Country Planning (Scotland) Act 1997 (TCPSA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999 as amended and EURATOM Article 37 (or an equivalent).

The current strategy is for an EIA to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPSA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the Phase 1 habitat survey that was undertaken to inform the EIA of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the Phase 1 habitat survey methods, results and conclusions.

1.2 Scheme description

Decommissioning of the Site is expected to commence in 2023. The site location is shown on **Figure 1.1, Appendix A**. Once the necessary consent is in place, the decommissioning process will begin with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over approximately a 15-year period there will be a process of safe storage and management of intermediate and low-level waste, with intermediate level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure – a clad, steel framed structure based around the reactor building – will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance – will involve ongoing site/station care and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the Site will operate similar to a conventional construction/demolition site.

1.3 Site context

The HNB site ('The Site' or 'the Station') is in North Ayrshire, approximately 9km south of Largs and 4km north-west of West Kilbride, on the Firth of Clyde coast. The centre of the Site is situated at Ordnance Survey (OS) Grid Reference NS 18400 51400, and the Nuclear Site Licence (NSL) boundary extends to approximately 30ha. Much of the Site is comprised of built structures and hard standing (predominantly access routes and car parks). Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study Area

The Site includes the land inside the HNB double security fence and the land that is covered by the HNB Nuclear Site Licence (NSL). The Study Area includes the Site and a 100m (approximately) perimeter area.

2.2 Desk Study

A desk-based study was undertaken to collate and review existing information on ecological features that are known to occur, or have previously been recorded, on land within and surrounding the Study Area defined in Section 2.1. These features include sites designated for nature conservation; habitats of importance for nature conservation; and legally protected and/or otherwise important species. The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]).

Data collected from the South West Scotland Environmental Information Centre (SWSEIC), formally Dumfries and Galloway Environmental Records Centre, includes details of species (including plants) recorded within approximately 3 km of the Site. The Hunterston B Land Management Annual Reviews[1] (LMAR) and Hunterston Integrated Land Management Plan[2] (ILMP) also include details of species (including plants) recorded within the Study Area.

2.3 Phase 1 habitat survey

Data collection locations and survey objectives

The Phase 1 habitat survey covered the land within the Study Area as defined in **Section 2.1.** The purpose of the Phase 1 habitat survey was to map the extent of different habitat types within the Study Area and identify areas of habitat that are potentially of notable biodiversity conservation value. This survey has been completed to collect information on the baseline status of habitats within the Study Area against which the predicted effects of the HNB Decommissioning Project will be assessed. The Phase 1 habitat survey also informed the scope of more detailed surveys at the HNB site, including faunal surveys.

Data collection methods

The Phase 1 habitat survey was completed in accordance with good practice, whereby distinct habitat types were identified and mapped, applying standard habitat definitions (JNCC 2010[3]). The optimal survey period is between late April and mid-October i.e. during the main period of vegetation growth, which is when different habitat types can be most accurately identified based on their component plant species. The survey was undertaken in June 2019, during this optimal survey period.

As part of the Phase 1 habitat survey method, Target Notes (TNs) are used to record the location and description (e.g. species composition and structure) of habitats of potentially notable nature conservation value and habitats that are restricted to small areas that could not be mapped accurately, as well as habitat mosaics or areas of transition between different habitat types. Target Notes are also used to record non-

[1] EDF Energy Nuclear Generation Ltd (2013 to 2018). Hunterston B Land Management Annual Review
[2] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.
[3] Joint Nature Conservation Committee (2010). *Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit*. JNCC, Peterborough.

native, invasive plant species[4]. Habitats or species that are of Principal Importance for the Conservation of Biodiversity in Scotland, listed on the Scottish Biodiversity List (SBL) [5], are also recorded, along with other species of notable nature conservation importance, such as Red Data Book/Red List species.

2.4 Constraints

Part of the Study Area is situated on land within Hunterston A Power Station, which was inaccessible during the survey. The habitats within this part of the Study Area were recorded/mapped using binoculars. This is appropriate as this area is predominantly hard standing and buildings, with limited/localised areas of vegetation around perimeter areas, including amenity grassland, plantation and tall ruderal vegetation, which can be identified without closer inspection.

[4] Section 14C of the Wildlife and Countryside Act 1981 (as amended in Scotland) makes it an offence to plant or otherwise cause to grow any plant out-with its native range. Guidance on non-native species is set out in: Scottish Government (2012). Code of Practice on Non-Native Species - Made by Scottish Ministers under section 14C of the Wildlife and Countryside Act 1981 (https://www2.gov.scot/Resource/0039/00398608.pdf.).

[5] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL

3. Results

3.1 Desk Study

The desk study identified areas of Ancient Woodland within 3km of the Site, the closest being Portencross Woods, approximately 0.1km to the south-west. The South West Scotland Environmental Information Centre (SWEIC) hold a record Japanese knotweed (*Fallopia japonica*), an invasive non-native species, within 3km of the Site. The HNB ILMP and LMAR report include records of Himalayan Balsam (*Impatiens glandulifera*) and *Rhododendron ponticum*, also invasive non-native species, within areas surrounding the HNB Station. The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]). The HNB ILMP and LMAR also report that Sea buckthorn (*Hippophae rhamnoides*), a native species, is subject to control measures to restrict its spread into areas of coastal grassland.

3.2 Phase 1 habitat survey

The habitats within the Study Area are mapped on **Figure 3.1, Appendix A**. The accompanying/numbered Target Notes (TN) are included in **Appendix B**, with the corresponding locations mapped on **Figure 3.1.** The land within the HNB double security fence is predominantly hard standing, including buildings and roads associated with the operational station, with the vegetation in this area mainly comprising amenity grassland. The coast is immediately to the west of the Site and there are areas of predominantly improved grassland to the north, with poor-semi-improved grassland to the east and south. No non-native invasive plant species were recorded.

Broadleaved plantation woodland

Broadleaved plantation woodland is present to the south of the site, within the NSL boundary. Some stands (e.g. TN 1, **Figure 3.1** and **Appendix B**) comprise a mix of semi-mature ash (*Fraxinus excelsior*), sycamore (*Acer Pseudoplatanus*), hawthorn (*Crataegus monogyna*), horse chestnut *(Aesculus hippocastanum*), and rowan (*Sorbus aucuparia*), while others (e.g. TN 2) are composed of beech (*Fagus sylvatica*) and more mature sycamore.

Mixed plantation woodland

Small stands of mixed plantation woodland are present to the south of the site, within the NSL boundary. One stand (TN 4, **Figure 3.1** and **Appendix B**) comprises mature ash, sycamore, Sitka spruce (*Picea sitchensis*) and alder (*Alnus glutionosa*), while the other (TN 5) comprises mature sycamore, beech and Scots pine (*Pinus sylvestris*) with scattered gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus*).

Parkland and scattered trees

Scattered broadleaved and coniferous trees are present both within and outside of the double security fence and NSL boundary (TN 7 - TN 10, **Figure 3.1** and **Appendix B**). A small, dense, stand of cedar (Cedrus spp.) trees (TN 11) is located within the northern part of the Site.

Semi-improved neutral grassland

A narrow band of semi-improved neutral grassland (TN 12, **Figure 3.1** and **Appendix B**) is present near the coastline to the north-west of study area, outside of the double security fence and NSL boundary. This habitat comprises a variety of species including false oat-grass (*Arrhenatherum elatius*), ribwort plantain (*Plantago lanceolata*), common bird's-foot trefoil (*Lotus corniculatus*), black medic (*Medicago lupulina*), thistle

(Cirsium sp.), nettle (*Urtica dioica*), yarrow (Achillea millefolium), sea radish (*Raphanus maritimus*), and occasional cock's-foot (*Dactylis glomerata*), reflecting the low intensity of management in this area. Stems of yellow iris (*Iris pseudacorus*) also occur locally in damper hollows within the grassland.

Improved grassland

Agricultural fields to the north of the double security fence and NSL boundary are predominantly improved grassland which is subject to grazing by sheep (TN 13, **Figure 3.1** and **Appendix B**). This habitat is characterised by the presence of white clover (*Trifolium repens*), perennial rye-grass (*Lolium perenne*), crested dogs-tail (*Cynosurus cristatus*), and daisy (*Bellis perennis*), with thistle present along field margins.

Marshy Grassland

Marshy grassland (TN 14, **Figure 3.1** and **Appendix B**) is present along the edge of a field drain situated outside of the double security fence and NSL boundary, to the south-east of the study area. This habitat comprises soft rush (*Juncus effusus*), yellow flag iris, silverweed (*Potentilla anserina*), water mint (*Mentha aquatica*), and dock (Rumex sp.). Another area of marshy grassland (TN 15) comprises soft rush, with a mixture of thistle, buttercup (Ranunculus sp.), rosebay willowherb (*Chamerion angustifolium*) and common ragwort *(Senecio Jacobaea*).

Poor semi-improved grassland

This habitat covers several areas to the south and west of the study area, outside the NSL boundary, often where land has been subject to ground disturbance. To the south-east of the NSL boundary (e.g. TN 16) the vegetation within this community comprises an abundance of Yorkshire fog (*Holcus lanatus*) and meadow grass (Poa sp.), with scattered black medic, common bird's-foot trefoil, and occasional dock. In other areas, thistle, nettle, soft rush, buttercup and sweet vernal-grass (*Anthoxanthum odoratum*) also frequently occur.

Tall ruderal

Tall ruderal vegetation, dominated by rosebay willowherb and bramble, is present within the NSL boundary to the east of the site (TN 19 and 20, **Figure 3.1** and **Appendix B**).

Running water

A single watercourse, in the form of a field drain (TN 14), is present to the south-east of the study area, outside the NSL boundary. Sea water enters a large cylindrical tank close to the northern edge of the double security fence (south of TN18). The Firth of Clyde is outside the NSL boundary to the west of the study area.

Shingle and boulders (above high-tide mark)

Shingle and gravel forms part of the coastline in the north-west of the study area, within which occasional scattered plants such as sea sandwort (*Honkenya peploides*) and orache (Atriplex sp.) species occur. Larger boulders are also present within this area, positioned for sea defence purposes.

Dune Scrub

Within the north-west of the study area, outside the double security fence and NSL boundary, the mixture of sea buckthorn and bramble is characteristic of dune scrub (TN 37).

Amenity grassland

Amenity grassland (e.g. TN 22) is the most common habitat within the double security fence. In places this grassland includes daisy, greater plantain (*Plantago major*), nettle and dock.

Ephemeral/ short perennial grassland

Ephemeral/short perennial grassland (e.g. TNs 24-30, **Figure 3.1** and **Appendix B**) is present both inside and outside the double security fence and NSL boundary, typically in areas of land with shallow stony soil that have been subject to disturbance. This vegetation predominantly comprises low-growing species, dominated by white clover and creeping buttercup (*Ranunculus repens*), with frequent greater plantain and occasional black medic, Yorkshire fog, soft rush and thistles.

Introduced shrub

Areas of planted and managed introduced shrub (TNs 31 and 32, **Figure 3.1** and **Appendix B**) are present inside the double security fence and NSL boundary and include species such as Rhododendron sp. barberry (Berberis sp.), sea buckthorn, beach rose (*Rosa rugosa*), cedar and Hydrangea sp.

Hedgerow

An intact hedgerow (TN 34, **Figure 3.1** and **Appendix B**) with blackthorn (*Prunus spinosa*), dog rose (*Rosa canina*), and hazel (*Corylus sp.*) is situated within the north-east of the study area, outside the double security fence and NSL boundary. Hedgerows are a SBL habitat of Principal Importance for biodiversity conservation.

Buildings

There are numerous buildings, including pumphouses, offices, portacabins, reactor buildings, storage facilities and workshops, within the double security fence and NSL boundary.

4. Summary

4.1 Current baseline

Habitats within the HNB double security fence

The habitats within the HNB double security fence predominantly comprise hard standing and buildings, amenity grassland and poor semi-improved grassland, with bordering areas of broadleaved woodland plantation, scattered broadleaved trees, and patches of tall ruderal vegetation. The habitats inside the security fence are likely to be of limited biodiversity conservation value.

Habitats outside the HNB double security fence

The habitats within the Study Area, outside the HNB double security fence, predominantly comprise improved grassland and poor semi-improved grassland. These habitats are typically of limited biodiversity conservation value. There is a hedgerow, a habitat type that is of Principal Importance for the conservation of Biodiversity, to the north-east of the double security fence and NSL boundary.

Appendix A
Figures

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218000

218500

651500

651000

N

HUNTERSTON 'A'

Hunterston Nuclear Generating Station

Stoney Port

Hillhouse

Pond

Ponds

Sewage Farm

Reservoir (covered)

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 100m
- Broadleaved woodland - plantation
- Mixed woodland - plantation
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Marsh/marshy grassland
- Tall ruderal
- Running water
- Shingle/gravel above high-tide mark
- Rocks/boulders above high-tide mark
- Dune scrub
- Amenity grassland
- Ephemeral/short perennial
- Introduced shrub
- Buildings
- Bare ground
- Other habitat
- Hardstanding
- Running water
- Intact hedgerow
- Fence
- Boundary removed
- Parkland and scattered trees- broad-leaved
- Parkland and scattered trees - coniferous
- Target note

0 50 100 150 200 m

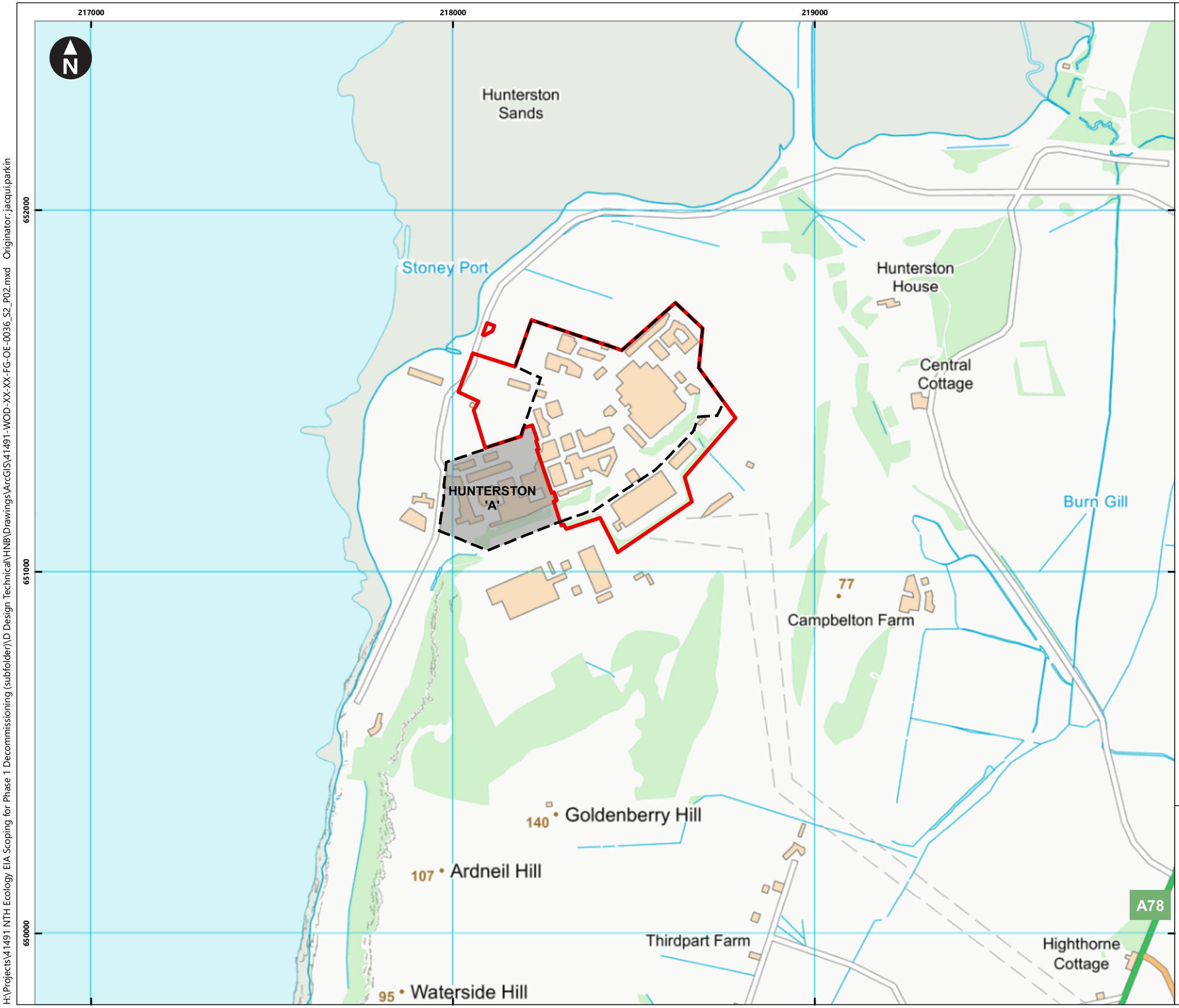
Scale at A3: 1:4,000

Hunterston B Decommissioning EIA
Baseline Report: Phase 1 Habitat Survey

Figure 3.1
Phase 1 habitat map

November 2019

wood.



Key

Hunterston B Nuclear Site Licence boundary

Double security fence

0 100 200 300 400 500 600 m

Scale at A3: 1:10,000

Hunterston B Decommissioning EIA
Baseline Report: Phase 1 Habitat Survey

Figure 1.1
Site location plan

November 2019

wood.

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Appendix B
Phase 1 habitat survey - Target Notes

Target Note (TN) marked on Figure 3.1	Description
1	Broadleaved plantation woodland, including ash, sycamore, hawthorn, horse chestnut and rowan, with scattered gorse. A patch of rhododendron near the base of the slope.
2	Mature broadleaved plantation woodland - almost entirely sycamore with some beech.
3	Broadleaved plantation woodland with ash, sycamore, hawthorn and elder.
4	Mixed plantation woodland comprising alder, ash, sycamore and Sitka spruce.
5	Mature mixed plantation with Scot's pine, sycamore and beech. Scattered gorse and bramble throughout.
6	Broadleaved parkland trees (approximately 8m-10m tall).
7	Broadleaved trees, including sycamore and willow.
8	Scattered broadleaved tree species next to hedgerow.
9	Small stand of broadleaved trees, mainly sycamore with some elder and hawthorn.
10	Mixed scattered trees (approximately 4-9m tall), including pine (Pinus sp.), sycamore, and cherry (Prunus sp.).
11	Stand of semi-mature cedar trees.
12	Roadside vegetation comprises frequent plantain (Plantago sp.), false oat-grass, bird's foot trefoil, black medic, thistle, nettle, yarrow, sea radish and occasional cock's-foot.
13	Grassland (livestock grazing) with frequent meadow grass (Poa sp.), crested dog's tail, creeping buttercup, perennial rye-grass, Yorkshire fog, daisy and common mouse ear (*Cerastium fontanum*), and thistle around the perimeter.
14	Marsh vegetation within and around a wet ditch - yellow flag iris, soft rush, silverweed, dock and water mint.
15	Soft rush, marsh thistle (*Cirsium palustre*), creeping buttercup, rosebay willowherb and ragwort.
16	Area has been subject to disturbance (construction works). Vegetation comprises Yorkshire fog, sweet vernal-grass, meadow grass, sorrel (Rumex sp.), dandelion (Taraxacum agg.), germander speedwell (*Veronica chamaedrys*) and occasional nettle.
17	Ground has been disturbed previously and includes soft rush, creeping buttercup, Yorkshire fog, sweet vernal-grass, thistle and nettles.
18	Soil mound/ bank around the perimeter of site which is overgrown with Yorkshire fog and meadow grass species. Broadleaved dock and thistle are frequent.
19	Overgrown with bramble, thistle, ferns, rosebay willowherb and nettles.
20	Overgrown with rosebay willowherb and bramble, with abundant red campion (*Silene dioica*), and scattered sycamore and elder (*Sambucus nigra*) saplings.
21	Mapped as tall ruderal vegetation due to density of dock and thistle, with grassland areas (white clover, meadow grass, curled dock (*Rumex crispus*), broadleaved dock (*Rumex obtusifolius*), Plantago sp., creeping buttercup and silverweed).

Target Note (TN) marked on Figure 3.1	Description
22	Amenity grassland, in places with daisy, greater plantain, nettle and dock.
23	Short, unmown grass with abundant white clover, frequent common mouse ear, creeping buttercup and dock.
24	Shallow stony soil with short vegetation dominated by buttercup and white clover. Thistle and Plantago sp. are frequent.
25	Slope supporting white clover and buttercup, with Yorkshire fog, thistle, occasional black medic and soft rush.
26	Short grassland supporting white clover, creeping buttercup, with occasional silverweed, Plantago sp., thistle and rosebay willowherb.
27	Grassland with abundant creeping buttercup, white clover, Plantago sp., thistle and dock, with frequent selfheal (*Prunella vulgaris*) and germander speedwell. Patches of bare ground.
28	Formally bare ground, with vegetation starting to regenerate e.g. creeping buttercup, dock and thistle.
29	Vegetation on stony, previously disturbed, ground, comprising abundant white clover, creeping buttercup; frequent Plantago sp., black medic, common bird's-foot trefoil, and Yorkshire fog; occasional perennial rye-grass and thistle.
30	Grassland with abundant buttercup, white clover, and thistle; frequent ribwort plantain, rosebay willowherb, common bird's-foot trefoil, dock, silverweed, occasional marsh orchid (Dactylorhiza sp.) and bramble around the perimeter.
31	Planted shrub beds with scattered sycamore and conifer trees.
32	Introduced shrubs - rhododendron sp., hydrangea sp., barberry sp., beach rose, sea buckthorn, cedar and sycamore.
33	Hedge on the northern side of a building, comprising a variety of species. Suitable habitat for nesting birds.
34	Intact hedgerow with hazel, blackthorn and dog rose.
35	Earth bank overgrown with scrub such as birch (Betula sp.), redcurrant (Ribes sp.) and dog rose, with some broom (*Cytisus scoparius*).
36	Roadside vegetation to the north of a track: abundant reed canary-grass (*Phallaris arundinacea*), curled dock, horsetail (Equisetum sp.), butterbur (*Petacites hybridus*), nettle, red clover (*Trifolium pratense*), black medic, vetch (Vicia sp.) and thistle.
37	Dense stand of sea buckthorn and bramble.
38	Ribwort plantain, common bird's-foot trefoil, marsh orchid, creeping buttercup, thistle, dock, and sedge (Carex sp.)
39	Hardstanding.

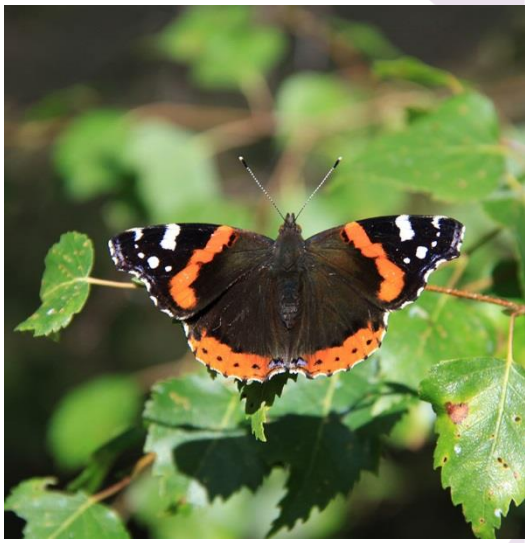
Appendix 7C.

Baseline Report: Otter

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Otter



Wood Environment & Infrastructure Solutions UK Limited – December 2019

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Document revisions

No.	Details	Date
1	Draft	September 2019
2	Final	December 2019

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy propose to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B (HNB) to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under Town and Country Planning (Scotland) Act 1997 (TCPA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999, as amended, and EURATOM Article 37 (or an equivalent).

The current strategy is for an EIA to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the otter (*Lutra lutra*) survey undertaken to inform the Environmental Impact Assessment (EIA) of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the otter survey methods, results and conclusions.

1.2 Scheme description

Decommissioning of the Site is expected to commence in 2023. The Site location is shown in **Figure 1.1, Appendix A.** The decommissioning process will begin with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over approximately a 15-year period there will be a process of safe storage and management of intermediate and low-level waste, with intermediate level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure – a clad, steel framed structure based around the reactor building – will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance - will involve ongoing site/station case and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the site will operate similar to a conventional construction/demolition site.

1.3 Site context

The HNB site ('The Site' or 'the Station') is in North Ayrshire, approximately 9km south of Largs and 4km north-west of West Kilbride, on the Firth of Clyde coast. The centre of the Site is situated at Ordnance Survey (OS) Grid Reference NS 18400 51400, and the Nuclear Site Licence (NSL) boundary extends to approximately 30ha. Much of the Site comprises built structures and hard standing (predominantly access routes and car parks). Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study area

The Site includes the land inside the HNB double security fence and the additional land that is covered by the HNB Nuclear Site Licence (NSL), as indicated on **Figure 1.1.** The Study Area includes all areas of potentially suitable otter habitat within the Site and a 250m perimeter area around the Site.

The Study Area exceeds, on a precautionary basis, the recommended criteria set out in the Scottish Natural Heritage (SNH) Protected Species Advice for Developers: Otter[1], which states: *'Otters occur throughout Scotland. Places where they might be present and could be disturbed by development works includes watercourses, coasts, estuaries and wetlands. Any of these habitats within 200m of the development should be surveyed for otters.'*

2.2 Desk study

A desk-based study was undertaken to collate and review existing information on ecological features that are known to occur, or have previously been recorded, on land within and surrounding the Study Area defined in Section 2.1. These features include sites designated for nature conservation; habitats of importance for nature conservation; and legally protected and/or otherwise important species (including otter). The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]).

Data collected from the South West Scotland Environmental Information Centre (SWSEIC), formally Dumfries and Galloway Environmental Records Centre, includes details of species (including otter) recorded within approximately 3 km of the Site. The Hunterston B Land Management Annual Reviews[2] (LMAR) and Hunterston Integrated Land Management Plan[3] (ILMP) also include details of species (including otter) recorded within the Study Area.

2.3 Otter survey

Survey objectives

Otter is a legally protected species (**Appendix B**) and a species of Principal Importance for the Conservation of Biodiversity in Scotland and as such is included on the Scottish Biodiversity List[4] (SBL). The potential effects of development on otter are therefore a material consideration in determining planning applications.

The purpose of the otter survey was to determine the status of this species within the Study Area. The survey derives the baseline status of otter against which the predicted effects of the HNB Decommissioning Project on this species will be assessed. Where necessary these survey data will also inform plans to mitigate the effects of the Project on otter.

[1] https://www.nature.scot/sites/default/files/2019-01/Species%20Planning%20Advice%20Project%20-%20otter.pdf
[2] EDF Energy Nuclear Generation Ltd (2013 to 2018). Hunterston B Land Management Annual Review
[3] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.
[4] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL

Data collection locations

A review of 1:25:000 scale Ordnance survey (OS) maps[5] and aerial imagery (Google Maps[6] and Bing Maps[7]) informed the targeting of survey effort, which focused on coastal areas and watercourses, such as ditches, within the Study Area. The surveys were extended away from these areas to include adjacent terrestrial habitats where these were judged by surveyors to be suitable for otter.

Data on potential breeding sites (within which a natal holt is located) tend to be sparse and in some instances contradictory, which may reflect the fact that females tend to choose remote and secretive locations, often some distance away from main watercourses, upstream along small tributaries, within reedbeds, scrub / woodland and sometimes in open ground (e.g. on peatland sites in Shetland and in other upland areas in Scotland (Liles 2003[8]). Breeding sites are most likely to occur adjacent to a good food supply, at locations that are undisturbed and at low risk of flooding.

Data collection methods

The otter survey was conducted on 17th July 2019, during low tide conditions to ensure maximum accessibility and survey cover within the Study Area. During the survey, all areas of potentially suitable otter habitat were inspected to map and record (location, type, condition, and age), in a series of 'Target Notes', evidence of otter activity, with reference to standard descriptions (Harris and Yalden 2008[9]; Bang and Dahlstom 2006)[10]; and Chanin 2003[11]):

- **Rest sites:**
  - Holt – underground features used for shelter and rest, often in natural cavities, such as tunnels at the edge of riverbanks, or underneath tree root plates, heather root matrices, or boulder piles. Holts can also be within man-made structures e.g drains or embankments;
  - Couch –typically above ground resting sites used for sleeping or grooming, often on the banks of watercourses, ponds or lochans and occasionally further inland in thick vegetation or reedbeds. Places ('rolling places') where the otter dries and grooms its fur after leaving the water may also be used as couches;
  - Natal holt/natal den – discrete holt that is used by a female to birth the cubs and where they can remain for up to three months; and
  - Nursery area – area within a breeding site where there is a high level of activity associated with cubs, which is unlikely to be the primary natal holt where the cubs were born.
- **Activity signs:**
  - Spraint **-** otter faeces, which tend to be black or green-black in colour and have distinct aromas. They are generally composed of fish remains and crustacean shells. Spraints are often located on prominent features within the channel or river bank, such as large rocks, and can also be found close to or within the entrance to holts or couches;
  - Feeding sign - remains of prey such as fish and skinned amphibians;

[5] www.ordnancesurvey.co.uk
[6] www.maps.google.co.uk
[7] https://www.bing.com/maps
[8] Liles, G. (2003). Otter Breeding Sites: Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5, English Nature Peterborough.
[9] Harris, S., Yalden, D.W. (2008). *Mammals of the British Isles: Handbook*, 4th Edition. Mammal Society.
[10] Bang, P., Dahlstrom, P. (2006). *Animal tracks and signs.* Oxford University Press.
[11] Chanin, P. (2003). *Ecology of the European Otter.* Conserving Natura 2000 Rivers, Ecology Series No. 10. English Nature, Peterborough.

- Prints - otters have five toes and unique footprints that can be identified in mud, silt or sand, typically at the edge of waterbodies;
- Paths - routes that otters use to traverse land, often between watercourses and resting places; and
- Play areas/ slides - areas where otters slide down a steep, often grassy, bank.

Rest sites that are indistinguishable as either holts or couches are categorised as 'rest sites'. Features that appear to be suitable as otter rest sites and lack evidence of otter activity were recorded as 'potential rest sites' (or potential holts or couches) and categorised as outlined above. Notes on habitat suitability within the Study Area more generally were also recorded. Features referred to as 'active' are features that include evidence of recent otter activity.

Survey constraints

A long stretch of rock armour along the coastline to the west of the Study Area has many interlinked crevices and sheltered alcoves and has the potential to support otter rest sites (holts/natal dens/nursery areas/couches). However, this structure was not safely accessible for close inspection and was checked from pathways and along the coastline (during low tide conditions) with the aid of binoculars.

3. Results

3.1 Desk study

There is a record (2015) of otter activity (spraint) within 3km of the Site. A dead otter has also been recorded previously on the HNB access road. These records are included in a separate report (*HNB Decommissioning EIA – Baseline Report: Desk Study [Terrestrial Ecology]*)

3.2 Field survey

The otter survey results are marked on **Figure 3.1, Appendix A** and the accompanying Target Notes (TN) and photographs are included in **Appendix C.** Evidence of otter activity was recorded along the rocky coastline to the north-west of the Study Area:

- Three otter holts (TN1-3), typically situated underneath large boulders that form sheltered underground cavities and are characterised by the presence of spraints;
- Otter couch (TN4) sheltered by a large boulder, but not extending underground or into a rock cavity, partially covered by rocks, with fresh and old spraints recorded; and
- Two potential holts (TN5 and TN6) in sheltered alcoves, extending beneath large boulders along the coastline, lacking obvious signs of otter activity.

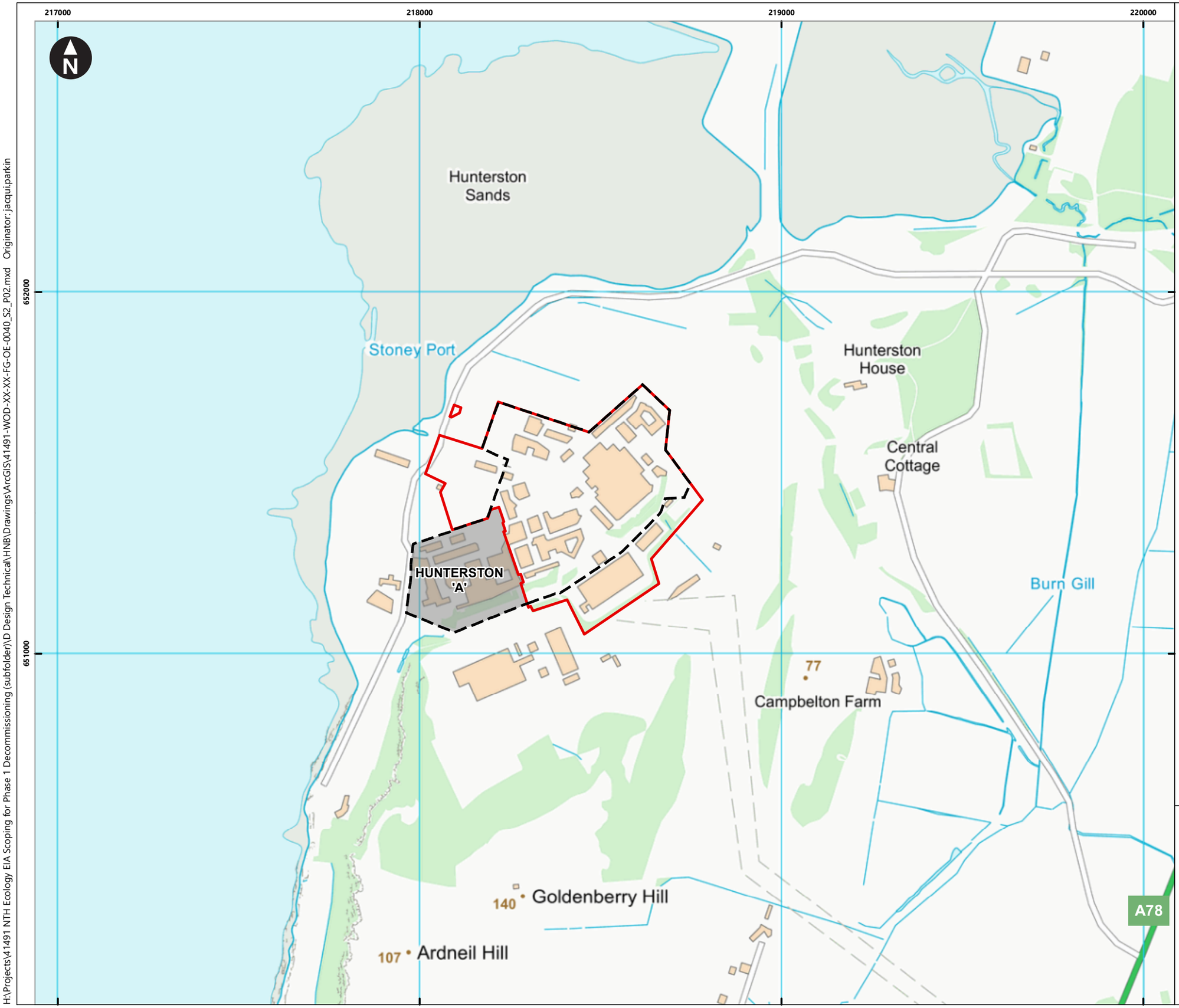
While it was not possible to survey the rock armour along the coastline to the south-west of the Study Area in detail, it has many interlinked crevices and sheltered alcoves (TN 7) and is likely to provide suitable habitat for otter rest/shelter sites.

4. Summary and conclusions

4.1 Current baseline

Evidence of otter activity was recorded along the rocky coastline within the north-western part of the Study Area, including spraints, three active holts, two potential holts, and one active couch. Crevices/alcoves in the rock armour extending along the coastline to the south-west of the Study Area, also provide potential rest/shelter sites. It is likely that otters use the coastline for foraging, commuting and resting. Otters could also establish natal holts and/or nursery areas within the Study Area, potentially making use of one or more of the coastal habitat features summarised in **Appendix C**.

Appendix A
Figures



Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence

0 100 200 300 400 m

Scale at A3: 1:10,000

Hunterston B Decommissioning EIA
Baseline Report: Otter

Figure 1.1
Site location plan

November 2019

wood.

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218000 218500 219000

652000 651500 651000

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 250m
- Holt
- Potential holt
- Couch
- Potential otter rest sites (holts/couches)
- Spraint
- Target note

0 100 200 300 m

Scale at A3: 1:5,000

Hunterston B Decommissioning EIA
Baseline Report: Otter

Figure 3.1
Otter survey results

November 2019

wood.

Appendix B
Relevant legislation

Otters are defined as a European Protected Species (EPS) under the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive). The Conservation (Natural Habitats *&* *c*.) Regulations 1994 (as amended in Scotland) translates this European legislation into Scottish law, which makes it an offence to deliberately or recklessly:

- Capture, injure or kill such an otter;
- Harass an otter or group of otters;
- Disturb an otter while it is occupying a structure or place used for shelter or protection;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access to an otter resting place or breeding site, or deny an animal use of a resting place or breeding site;
- Disturb an otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
- Disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is also an offence to damage or destroy a resting place or breeding site of an otter (whether deliberately or recklessly), and to keep, transport, or offer for sale or exchange, any wild otter.

Any activity that is likely to affect an otter requires consultation with the relevant statutory nature conservation organisation prior to works commencing. In Scotland, this is Scottish Natural Heritage (SNH).

Appendix C
Target Notes

Target Note	Evidence of otter activity	Grid reference	Description	Photograph
1	Holt	NS 17822 51528	A sheltered alcove extending two to three metres under large concrete slabs. At least four spraints (recent and old) inside the alcove.	
2	Holt	NS 17897 51582	Otter holt within a sheltered alcove, extending beneath large boulders. Two potential entrances/ exits. One fresh and one old spraint inside the alcove.	
3	Holt	NS 17906 51586	Otter holt in sheltered alcove, extending under large boulders. One fresh otter spraint at the entrance.	
4	Couch	NS 17892 51578	Otter couch under two leaning rocks, which is open to the elements on both sides. A pile of fresh and old spraint within the feature.	

5	Potential holt	NS 18087 51712	Potential holt extending under a large rock on the beach. One recent spraint inside alcove.	
6	Potential holt	NS 17911 51568	Potential holt, under boulders. No evidence of otter activity, however a large tunnel extends two to three metres into the bank.	
7	Potential otter rest sites (holts/couches)	NS 17776 51077	Coastal rock armour provides an extensive area of habitat suitable for otter rest/shelter sites. This area was not safely accessible and was not be surveyed in detail.	
8	Spraint	NS 17990 51618	Fresh spraint on rock.	N/A

Appendix 7D.

Baseline Report: Badger

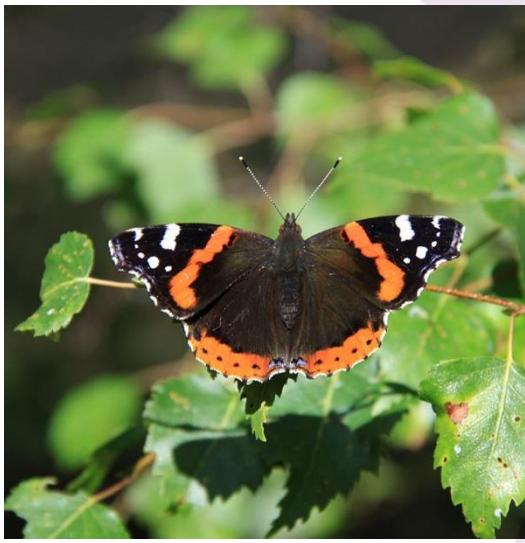
Appendix 7E.

Baseline Report: Bats

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Bats



Wood Environment & Infrastructure Solutions UK Limited – December 2019

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1.2 Scheme description

Decommissioning of the Site is expected to commence in 2023. The Site location is shown in **Figure 1.1, Appendix A.** The decommissioning process will begin with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over approximately a 15-year period there will be a process of safe storage and management of intermediate and low-level waste, with intermediate-level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

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1.3 Site context

The HNB site ('The Site' or 'the Station') is in West Kilbride, North Ayrshire, situated on the Firth of Clyde. The centre of the station is at approximate National Grid Reference (NGR) NS 184 514 and the area that is subject to the Nuclear Site Licence (NSL) extends to approximately 30ha. The majority of the station is built structures and hard standing (mainly access and car parks). Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study Area

The site includes the land inside the HNB double security fence and the land that is covered by the HNB Nuclear Site Licence (NSL). The Study Area includes the Site and a 50m (radius) perimeter area ('buffer'). The study area is shown on **Figure 2.1**. **Appendix A**.

2.2 Desk study

A desk-based study was undertaken to collate and review existing information on ecological features that are known to occur, or have previously been recorded, on land within and surrounding the Study Area defined in **Section 2.1**. These features include sites designated for nature conservation; habitats of importance for nature conservation; and legally protected and/or otherwise important species (including bats). The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]).

Data collected from the South West Scotland Environmental Information Centre (SWSEIC), formally Dumfries and Galloway Environmental Records Centre, includes details of species (including bats) recorded within approximately 3 km of the Site. The Hunterston B Land Management Annual Reviews[1] (LMAR) and Hunterston Integrated Land Management Plan[2] (ILMP) also include details of species (including bats) recorded within the Study Area.

2.3 Field surveys

Overview

All UK bat species are legally protected (**Appendix B**). A number of bat species are also Species of Principal Importance for the Conservation of Biological Diversity in Scotland and as such are included on the Scottish Biodiversity List[3] (SBL). The potential effects of development on bats are therefore a material consideration in determining planning applications. The HNB Decommissioning project has the potential to have adverse effects on bats that roost within and/or outside of the Site boundaries, recognising that bats that roost outside a development site may use that site for commuting and/or foraging. This has been taken into account in defining the scope of the baseline surveys.

[1] EDF Energy Nuclear Generation Ltd (2013 to 2018). Hunterston B Land Management Annual Review
[2] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.
[3] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL

The purpose of the surveys was to derive the baseline status of bats within the Study Area, against which the predicted effects of the HNB Decommissioning Project on this group of species will be assessed. Where necessary the survey data will also inform plans to mitigate the effects of the Project on bats.

No surveys were undertaken within HNA (**Figure 2.1**), which is predominantly hard standing and buildings, because the HNB decommissioning project does not currently include any planned activities within HNA.

The bat surveys involved a combination of bat roost surveys and bat activity surveys, progressing systematically from Preliminary Roost Assessment (PRA) surveys to more detailed surveys based on Bat Conservation Trust (BCT) guidance (Collins, 2016[4]). The different survey methods that were employed are described below, following the sequence in which they are presented in the BCT Guidelines (Collins, 2016) and divided into those that focus on bat roosts and those that focus on other bat activity.

Bat roost survey

Preliminary Roost Assessment – buildings/structures

The built structures within the HNB double security fence, excluding buildings within the adjacent Hunterston A station, were subject to PRA. The purpose of this was to determine the requirement for, and scope of, any follow-up bat activity survey work and/or any more detailed inspection of potential bat roosts, including hibernacula (over-wintering roosts). The PRA was undertaken during suitable weather conditions (warm and dry) on 13th, 14th and 16th May 2019.

The survey method was in accordance with standard good practice guidance (Collins, 2016). The buildings and structures within the Study Area were systematically inspected during daylight, and any features suitable for roosting bats were recorded. This can include, for example, weatherboarding, hanging tiles, soffit boxes, gaps in brickwork, cracks, crevices, slipped or broken tiles and gaps around ridge tiles and lead flashing. Potential entry/exit points to Potential Roost Features (PRFs) were also recorded. PRFs are defined by Collins (2016) as "*features that bats could use for roosting*". Roof coverings were viewed from ground-level using close-focusing binoculars. Any potential bat roost entry/exit points were identified and inspected for evidence of roosting bats, for example:

- Bat droppings on the ground or stuck to walls beneath potential roost entrances;
- Suitable entry and exit points around eaves, soffits, flashing, under tiles or gaps in mortar;
- Live bats, bat corpses or skeletons; and,
- Oily marks (from fur), or localised clean spots, around possible roosts/roost access points.

The aim of the PRA was to determine actual or potential presence of bats and to determine the need for, and scope of, any further survey effort. In accordance with good practice (Collins, 2016) the buildings were categorised according to their suitability for roosting bats (**Table 2.1**).

[4] Collins, J. (2016). Bat Surveys: Good Practice Guidelines. 3rd edition. Bat Conservation Trust. London.

Table 2.1 Guidelines on suitability of buildings for roosting bats (Collins 2016)

Suitability	Description
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[a] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation[b]).
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions[a] and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions[a] and surrounding habitat.

[a] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

[b] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015 in Collins 2016). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

The PRA is an initial assessment of the suitability of structures for roosting bats, based on observation of the exterior of the buildings only and informs the scope of follow-up survey work. It does not confirm presence/absence of bat roosts.

Preliminary Ground Level Roost Assessment - trees

A Preliminary Ground Level Roost Assessment was completed of all trees within the NSL area to identify potential bat roost features in the tree trunk/limbs i.e. cracks, crevices, holes (e.g. woodpecker holes), splits, ivy cladding, lifted bark and fissures. The aim of the preliminary Ground Level Roost Assessment was to determine actual or potential presence of bats and any requirement for, and scope of further survey work. The Preliminary Ground Level Roost Assessment was undertaken on 13th, 14th and 16th May 2019.

A rating of High, Moderate, Low or Negligible potential to support roosting bats was assigned to each tree or group of trees in accordance with BCT Guidelines (Collins, 2016). The surveyors used binoculars to look for evidence of bat activity associated with the above features, for example scratch marks, staining, droppings, and absence of cobwebs at potential roost access points. In accordance with relevant guidance, trees assigned a rating of Negligible or Low suitability were excluded from further surveys (Collin, 2016). The main focus of this assessment was to assess the suitability of trees as transitional, maternity, satellite or mating roosts during the bats' core active season (principally April-September). Any trees that appeared to be suitable for hibernating bats were also recorded.

Emergence/re-entry surveys – buildings/ structures

Following the Preliminary Roost Assessment (PRA), emergence/re-entry surveys were undertaken to determine whether the buildings/structures (Low, Moderate or High suitability) within the HNB double security fence were being used as roosts at the time of survey. This was undertaken in accordance with good practice (Collins 2016, Chapter 7), which recommends that buildings with 'High' roost suitability are subject to three surveys (two emergence surveys and one re-entry survey); those of 'Moderate' suitability are subject to two surveys (one emergence survey and one re-entry survey); and buildings with 'Low' suitability are subject to either one emergence or one re-entry survey.

The surveys consisted of dusk emergence and/or dawn re-entry surveys, during which surveyors observed the exterior or the potential roost and recorded any bats leaving or entering a roost. The surveys started either 15 minutes before sunset (emergence) or 2 hours before sunrise (re-entry) and continued for a period of 1.75 to 2 hours. When more than one survey was required as indicated above, at least one survey was a re-entry survey (Collins, 2016).

The surveys were conducted from July to September 2019 inclusive, in suitable weather conditions, i.e. at an ambient temperature of 10ºC or above, low wind and light or no rain. One survey was conducted between July and August on each building. In circumstances when more than one survey was required, the surveys were spread across the survey season, with at least two weeks between surveys. The survey parameters (including dates, start/finish times and prevailing weather conditions) are detailed in **Appendix C.**

Canon XA30 video cameras with infrared capabilities, accompanied by separate powerful infrared light sources, were used during the surveys to aid observation of bats in low light levels. Bat activity was recorded using a combination of visual observation and aural full spectrum or frequency division bat detectors (Elekon Batlogger M), which enable bats' ultrasonic calls to be heard. All bat calls were recorded digitally using the in-built recording feature.

Re-entry survey – short walked transects

A number of buildings were categorised as having 'Low to Negligible' ('particularly low') suitability for roosting bats, such as buildings that are of low suitability and also appear to be particularly prone to disturbance from lighting and/or noise. Rather than emergence/re-entry surveys, these buildings were subject to surveys along short, walked transects (Transects A to D, **Figure 2.2, Appendix A**) around the perimeter of these buildings. This was to allow observation of any bats returning to, or re-entering, roosts, recognising that bats can tend to 'swarm' near a roost entrance before entering. Each transect circuit took up to 10 minutes to complete, with surveyors deviating slightly from the transect route in response to any bat observed/recorded close to sunrise i.e. to attempt to track bats back to a roost.

The surveys were conducted from July to September 2019 inclusive, in suitable weather conditions, i.e. at an ambient temperature of 10ºC or above, low wind and light or no rain. The survey parameters (including dates, start/finish times and prevailing weather conditions) are detailed in **Appendix C**. These surveys began two hours before, and ended 15 minutes after, sunrise, encompassing the most likely period of pre-dawn foraging activity and re-entry into roosts. Bat activity was recorded using a combination of visual observation and aural full spectrum or frequency division bat detectors (Elekon Batlogger M), which enable bats' ultrasonic calls to be heard, with all bat calls recorded digitally using the in-built recording feature.

Bat activity surveys

Automated/static detectors

Two automated/static bat detectors (Elekon BatLogger A+) were deployed to record bat calls continuously, from 30 minutes before sunset to 30 minutes after sunset and for 5 consecutive nights per season: spring (April/May), summer (June/July/August) and autumn (September/October), in accordance with good practice (Collins 2016). One static detector was attached to a tree inside the double security fence, within the Site and one was attached to a fence on a grassland embankment adjacent to a strip of woodland, within the 50m perimeter area around the Site (**Figure 2.3, Appendix A**). The monitoring periods and weather conditions during these periods are included in **Section 3**.

Transect surveys

The scope of the bat activity transect surveys was determined based on an assessment of the suitability (for bats) of the habitats within the Study Area, in accordance with BCT Guidelines (Collins, 2016). The Study Area

mainly comprises areas of hard standing, improved grassland and poor semi-improved grassland and is of relatively 'Low' suitability for bats. A single survey transect route was defined to cover this range of habitats within the Study Area. The transect route is detailed, alongside the survey results, in **Section 3**.

The transect was surveyed once in spring (April/May), summer (June/July/August) and autumn (September/October), in suitable weather conditions, i.e. at an ambient temperature of 10°C or above, low wind and light or no rain. The survey parameters (including dates and prevailing weather conditions) are detailed, along with the survey results in **Section 3**. The spring and autumn surveys were undertaken in the same direction along the transect, whereas the direction was reversed during the summer survey, sampling different parts of the transect at differing times after sunset.

In each case the surveyor walked along the transect from sunset, for a minimum of two hours after sunset, recording the bat species observed, the number of bat passes and the type of activity (e.g. foraging, social calls). Bat calls were monitored using Elekon BatLogger M detectors, with all bat calls recorded digitally using the in-built recording feature.

Data analysis

Data/recordings collected by the automated/static detectors and by hand-held detectors during transect surveys (and roost emergence and re-entry surveys) were analysed using BatExplorer software, with reference to Russ 2012[5] to aid species identification. Bats were identified to species where possible. In some cases bats could only be identified to genus/species group, for example in the event that the recorded calls could not be separated/attributed to one of two species that have similar/overlapping call parameters e.g. *Pipistrellus* sp. (common pipistrelle or soprano pipistrelle); and *Nyctalus* sp. (noctule or Leisler's bat).

Survey parameters

As outlined above, the bat surveys were undertaken during suitable weather conditions, with little or no rain, no excessive wind and temperatures above 10°C. These conditions are unlikely to deter bats from flying. Temperature, humidity, cloud cover and rainfall were recorded by the surveyors during each survey. Other relevant environmental parameters that could influence bat activity, such as background noise or artificial light, were also noted. Details of the recorded survey parameters are included in **Section 3**.

Dawn re-entry surveys and dawn activity transect surveys were undertaken within the period July to early September, when bats are most likely to remain active throughout the night. This avoided spring and autumn, when bats are more likely to return to roost early and not emerge again before sunrise.

5 Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic publishing.

Survey constraints

A malfunction on Static Detector 2 (**Figure 2.3**) resulted in only 4 days (4th to 7th September 2019) of recording by this detector in September. However, a total 14 days of bat activity data were recorded at this location over the 15-day monitoring period and this is unlikely to have substantively influenced the survey results/conclusions.

3. Results

3.1 Desk study

Statutory biodiversity sites

There are no statutory biodiversity sites that are designated or notified for bats within 10km of the Site. Portencross Woods SSSI, however appears to be notable in terms of its proximity to the Site (0.3km west of the Site) and its potential to provide foraging and/or roosting habitat for bats. Statutory site descriptions and locations are detailed in a separate Desk Study report (*Hunterston B Decommissioning EIA – Baseline Report: Desk Study [Terrestrial Ecology]*).

Non-statutory biodiversity sites

There are no non-statutory biodiversity sites within 3km of the Site that are designated for bats or have bats listed in their citations. A total of 19 non-statutory biodiversity sites situated within approximately 3km do, however, appear to be notable in terms of their potential to provide foraging and/or roosting habitat for bats and the site descriptions and locations are included in a separate Desk Study report (*Hunterston B Decommissioning EIA – Baseline Report: Desk Study [Terrestrial Ecology]*):

- Goldenberry Hill SWT Wildlife Site (0.25km south);
- Campbelton Hill and Watermeadow SWT Wildlife Site (0.5km south-east);
- Ardneil Bank Wood and Southbanks, Portencross SWT Wildlife Site (1.75km south);
- Glen Burn (Crosbie to North Southannan) Provisional SWT Reserve (2km east);
- Seamill to Ardneil Bay Provisional SWT Reserve (2.3km south);
- Portencross Woods - Ancient Woodland Inventory (0.1km south-west);
- Goldenberry - Ancient Woodland Inventory (0.2km south);
- Campbelton Wood - Ancient Woodland Inventory (0.36km south-east);
- Hunterston House Wood - Ancient Woodland Inventory (0.5km east);
- Thicket Plantation - Ancient Woodland Inventory (1.4km south);
- Kilruskin Wood - Ancient Woodland Inventory (1.5km east);
- Ardneil Bank Wood - Ancient Woodland Inventory (1.9km south east);
- Carlung Wood - Ancient Woodland Inventory (2 km south east);
- Kilruskin Glen Ancient Woodland Inventory (2 km east);
- The Glen - Ancient Woodland Inventory (2.1 km north-east);
- Allan Wood - Ancient Woodland Inventory (2.25 km north-east);
- Dykes Plantation - Ancient Woodland Inventory (2.7 km east);
- The Avenue - Ancient Woodland Inventory (2.9 km south-east); and
- South Annan - Ancient Woodland Inventory (3.1 km north-east).

Bat records

The South West Scotland Environmental Information Centre (SWSEIC) holds records of Common pipistrelle (Pipistrellus pipistrellus), Soprano pipistrelle (*Pipistrellus pygma*eus), brown long-eared (*Plecotus aurita*) and Myotis sp. within 3km of the Site. However, SWSEIC does not hold any records of bat roosts within 5km of the Site. The Hunterston B ILMP and LMARs include details of inspections of bat boxes around the Hunterston Estate between 2015 and 2018, which recorded roosting bats, including but not necessarily limited to soprano pipistrelle and common pipistrelle.

3.2 Field surveys

Overview

Based on BCT Guidelines (Collins, 2016), the habitats within the Study Area have been categorised collectively as being of Low suitability for bats, predominantly comprising hardstanding, improved grassland and poor semi-improved grassland, with only limited extents of more suitable habitats, including hedgerows, broadleaved woodland, mixed planation and scattered trees. The bat survey scope was therefore consistent with that recommended (Collins, 2016) for surveys of potential roosts and for habitats that are of Low suitability for bats:

- Preliminary Roost Assessment;
- Emergence/re-entry surveys of potential roosts – plus surveys of particularly low suitability buildings along short, walked transects;
- Automated/ Static Bat Activity Surveys; and
- Transect Bat Activity Surveys

Bat roost surveys

Preliminary Roost Assessment – buildings and built structures

The majority of buildings within the study area are of negligible, or low to negligible, suitability for roosting bats, being of modern construction, lacking obvious potential roost features and prone to disturbance from noise/lighting. A total of 41 buildings/built structures or building complexes within HNB are potentially suitable (High, Moderate, Low and Low-to-Negligible suitability) for roosting bats as summarised in **Table 3.1**. Table 3.1 also indicates the level of follow-up survey work (emergence/re-entry survey) required at each building. The locations of buildings that are potentially suitable for roosting bats are shown on **Figure 3.1**. Further details of these buildings and associated features that are potentially suitable for roosting bats are included in the PRA results (**Appendix D)**.

A total of 48 buildings/ built structures/complexes within the HNB double security fence are likely to be of negligible suitability for roosting bats – these are omitted from Figure 3.1 and included on **Sheet 1 (Appendix A)**: **29, 32, 34, 43, 46, 47, 48, 50, 51, 52, 111, 116, 117, 122, 130, 143, 145, 148, 151, 159, 171, 174, 177, 178, 179, 181, 184, 185, 191, 193, 194, 196, 198, 199, 201, 202, 205, 206, 208, 209, 210, 215, 217, 221, 225, 244, 246** and **249.**

The buildings within the double security fence are unlikely to be suitable as bat hibernacula. Buildings that are currently occupied/in use are prone to disturbance and temperature fluctuations and therefore do not provide stable conditions suitable for hibernating bats. Similarly, the other buildings do not appear to include internal voids or superficial features that would be likely to create stable (cool and humid) conditions suitable for hibernating bats.

Table 3.1 Preliminary Roost Assessment (categorisation of roost suitability)

Moderate suitability (one dusk emergence survey and one dawn re-entry survey)	Low suitability (one dusk emergence or one dawn re-entry survey)	Low to negligible suitability (require walked transect only)[1]
197, 224	27, 35, 42, 108, 115, 118, 142, 152, 153, 207, 212, 216, 227, 228, 229, 231, 248.	28, 31, 102, 119, 123, 132, 139, 147, 160, 161, 162, 172, 175, 176, 180, 186, 189, 190, 192, 203, 214, 239.

[1] Low suitability buildings are separated according to the follow-up survey work that is planned to determine likely presence/absence of roosting bats. A number of buildings have particularly low (Low to Negligible) suitability due to high levels of lighting and noise disturbance from machinery and have subsequently been surveyed using walked transects around the building, whereas other low suitability buildings have been subject to emergence/re-entry surveys according to BCT Guidance (Collins, 2016). These follow-up surveys are described below.

Preliminary Ground Level Roost Assessment - trees

The trees within the NSL area (**Figure 3.2**) have either Low or Negligible suitability for roosting bats, being predominantly immature/sub-mature trees of plantation origin and lacking potential bat roost features. Therefore, no further bat surveys of these trees are required.

Emergence/re-entry surveys – buildings/structures

The PRA surveys concluded that 19 buildings (Low and Moderate suitability for roosting bats) required emergence/re-entry surveys (**Table 3.1** and **Figure 3.1**). Emergence/re-entry surveys were conducted on all of these buildings in 2019. The survey parameters (including dates, start/finish times and prevailing weather conditions) are detailed in **Appendix C.** No bat roosts were recorded at any of these buildings.

Re-entry survey – short walked transects

A total of 22 buildings within the HNB double security fence are categorised as being of Low to Negligible suitability for roosting bats (**Table 3.1** and **Figure 3.1**) and were surveyed along short, walked transects around these buildings (**Figure 2.2**). No bat roosts were located during the short walked transect surveys. The survey parameters (including dates, start/finish times and prevailing weather conditions) are detailed in **Appendix C.**

Bat activity surveys

Automated/static surveys

The two batloggers deployed within the Study Area are referred to as Detectors 1 and 2 (**Figure 2.3**). Detector 1 was deployed inside the HNB double security fence, attached to a young sycamore tree (*Acer pseudoplatanus*), located approximately centrally within the Site. Detector 2 was deployed outside of the double security fence, attached to a fence on a grass embankment, adjacent to an area of broadleaved planation woodland, within the 50m perimeter area around the Site. The detectors were deployed for 5 nights during spring (17th to 21st May 2019), summer (20th to 24th July) and autumn (4th to 8th September). Minimum night time temperatures during this monitoring period where generally between 9°C and 17°C, falling below this to 6°C on two occasions (7th and 8th September).

Three species of bat were recorded:

- Common pipistrelle (*Pipistrellus pipistrellus*);
- Soprano pipistrelle (*Pipistrellus pygma*eus); and
- Noctule (*Nyctalus noctula*).

The total number of bat passes recorded by each static detector during the monitoring periods (5 nights) in spring (Table E1), summer (Table E2) and autumn (Table E3), as well as the total number of bat passes (separated by species) recorded during the three monitoring periods combined (Table E4) are summarised in **Appendix E**. Tables E1 to E4 (**Appendix E**) also include the mean number of bat passes per night recorded over each monitoring period.

Bats were recorded on all monitoring nights at Detector 2. There were a number of monitoring nights when no bat passes were recorded at Detector 1.

The most frequently recorded species was soprano pipistrelle, with a total of 2,295 passes recorded over 14 nights, with activity of this species highest at Detector 2 (mean 163.5 passes per night), compared to Detector 1 (mean 0.4 passes per night).

The second most frequently recorded species was common pipistrelle, with a total of 1,533 passes (mean 105.2 passes per night). Common pipistrelle was recorded more frequently than soprano pipistrelle at Detector 1, with an average (mean) of 6 passes per night, compared to 0.4 passes per night.

No noctule passes were recorded at Detector 1, however noctule was recorded at Detector 2 (mean of 3 passes per night). The majority of these passes (97%) occurred in summer (July). No noctule passes were recorded in May. A single pass by Nyctalus sp. was recorded at Detector 2 in July. It was not possible to distinguish whether this was attributable to a noctule (*Nyctalus noctula*) or Leisler's (*Nyctalus leisleri*) bat.

Transect surveys

The results of the three (spring, summer and autumn) bat activity surveys (transects) are summarised in **Table 3.2** and on **Figures 3.3** (May 2019)**, Figure 3.4** (July 2019) and **Figure 3.5** (September 2019). The transect surveys recorded similar species to the automated/static detector monitoring. Bat activity recorded during the transect surveys tended to be recorded within the south and east of the Study Area. More detailed survey results (Table F1 to F3) and survey parameters (including dates, start/finish times and prevailing weather conditions) are included in **Appendix F**.

Table 3.2 Transect Survey Results (Summary)

Date	Weather conditions	Bat species
13 May 2019	Warm (16°C) calm, dry. Weather conditions over previous days also ideal.	Soprano pipistrelle; Common pipistrelle
22 July 2019	Warm (18°C) light wind, dry. Weather conditions over previous days also ideal.	Soprano pipistrelle; Common pipistrelle; Noctule; and *Nyctalus* sp.
16 September 2019	Mild (15-13°C) calm, dry. Weather conditions over previous days also ideal.	Soprano pipistrelle; Common pipistrelle; *Pipistrellus* sp and *Nyctalus* sp

4. Summary and conclusions

4.1 Current baseline

Overview

The habitats within the Study Area are predominantly hardstanding, improved grassland and poor semi-improved grassland, which are of low suitability for bats. The habitats within HNA are similar to those within HNB. There is only a limited extent of more suitable habitats for bats within the Study Area, such as hedgerow, broadleaved woodland, mixed planation and scattered trees. Collectively therefore, the habitats within the Study Area are of low suitability for bats.

Three species of bats were recorded within the Study Area: soprano pipistrelle, common pipistrelle and noctule. Based on published information on the status and distribution of bats in the UK (Bat Conservation Trust, 2017; and Ayrshire Biodiversity Action Plan) the presence of these species in North Ayrshire is not unexpected. A single pass by Nyctalus sp. was recorded in July, however it was not possible to distinguish whether this was attributable to a noctule (*Nyctalus noctula*) or Leisler's (*Nyctalus leisleri*) bat.

The majority of buildings within the study area are of negligible, or low to negligible, suitability for roosting bats, being of modern construction, lacking obvious potential roost features and prone to disturbance from noise/lighting. There are buildings inside the double security fence that are of Moderate and Low suitability for roosting bats, however no bat roosts were recorded. This is likely to be attributable, at least in part, to the extent of hardstanding, limited vegetation and noise/light disturbance within this area; factors which mean the station is poor bat habitat more generally.

The buildings within the double security fence are unlikely to be suitable as bat hibernacula. Buildings that are currently occupied/in use are prone to disturbance and temperature fluctuations and therefore do not provide stable conditions suitable for hibernating bats. Similarly, the other buildings do not appear to include internal voids or superficial features that would be likely to create stable (cool and humid) conditions suitable for hibernating bats. The trees within this area, and the NSL area more generally, are of Low or Negligible suitability for roosting bats, being immature/sub-mature trees, of plantation origin and lacking potential bat roost features.

Low levels of bat activity (e.g. foraging/commuting) were recorded inside the double security fence. This area of predominantly hardstanding includes limited vegetation and is well illuminated in places and prone to noise disturbance from operational machinery. The habitats outside of the double security fence and around the perimeter of the Nuclear Site Licence Area appear to be less prone to light/noise disturbance and include improved grassland and poor semi-improved grassland, with limited extents of hedgerow, broadleaved woodland, mixed planation and scattered trees. These are more suitable habitats for bats, which is reflected in notably higher levels of bat activity in these areas.

Common pipistrelle and Soprano pipistrelle

Both common pipistrelle and soprano pipistrelle are Species of Principal Importance for the Conservation of Biological Diversity in Scotland (SBL species). They are two of the most common and widespread bat species that are resident in Scotland. Historic changes in agricultural practices throughout the UK coincided with a decline of these species. However, populations are being continuously monitored through surveys such as

the National Bat Monitoring Programme (NBMP) and through data collected in the field by professionals. These data indicate that common and soprano pipistrelle populations are increasing (BCT 2017[6]).

Summer roosts of both soprano and common pipistrelles tend to be in crevices around the outside of newer buildings, the average roost consisting of 200 individuals (BCT 2010a[7]). However, roosts can be found in trees and bat boxes, where pipistrelles can also be found in autumn and over winter. Pipistrelles tend to emerge from their roost 20-30 minutes after sunset and forage mainly on small insects such as midges. Soprano pipistrelles appear to have a closer affinity to riparian landscapes, often feeding over wetland habitats. Common and soprano pipistrelles are known to travel 5km from a roost (Avery 1991[8]) and although these species use a range of habitats, they exhibit preferences for riparian woodland and parkland and tend to avoid very open habitat. They often forage along regularly used flightpaths.

Soprano pipistrelle was the most frequently recorded species within the Study Area, followed by common pipistrelle. No roosts of either species were recorded, however both species are known to roost in bat boxes within the HNB Estate.

Low levels of soprano and common pipistrelle activity were recorded inside the double security fence. This area of predominantly hardstanding, includes limited vegetation and is well illuminated in places and prone to noise disturbance from operational machinery. The habitats outside of the double security fence, and around the perimeter of the Nuclear Site Licence Area, appear to be less prone to light/noise disturbance and include improved grassland and poor semi-improved grassland, with limited extents of hedgerow, broadleaved woodland, mixed planation and scattered trees. These habitat types tend to support greater concentrations of invertebrates, providing more foraging opportunities for bats than those inside the double security fence. This is reflected in notably higher levels of common pipistrelle and soprano pipistrelle activity recorded outside of the double security fence.

Noctule

Noctule is a Species of Principal Importance for the Conservation of Biological Diversity in Scotland (SBL species). Noctules forage over a range of habitat types, often including open woodland, unimproved grassland, lakes and rivers, where their prey is most common. This species roosts in holes in trees, with a preference for woodpecker holes in beech trees on the edge of woods or in the open.

[6] Bat Conservation Trust (2017). *The State of the UK's Bats – National Bat Monitoring Programme Population Trends* (http://www.bats.org.uk/pages/nbmp_reports.html)
[7] Bat Conservation Trust (2010a). Species Information Sheets - Soprano pipistrelle and Common pipistrelle (https://www.bats.org.uk/about-bats/what-are-bats/uk-bats).
[8] Avery, M. I. (1991). The Handbook of British Mammals (Ed. by G. B. Corbet & S. Harris), pp. 124-128. Oxford. Blackwell Scientific Publications

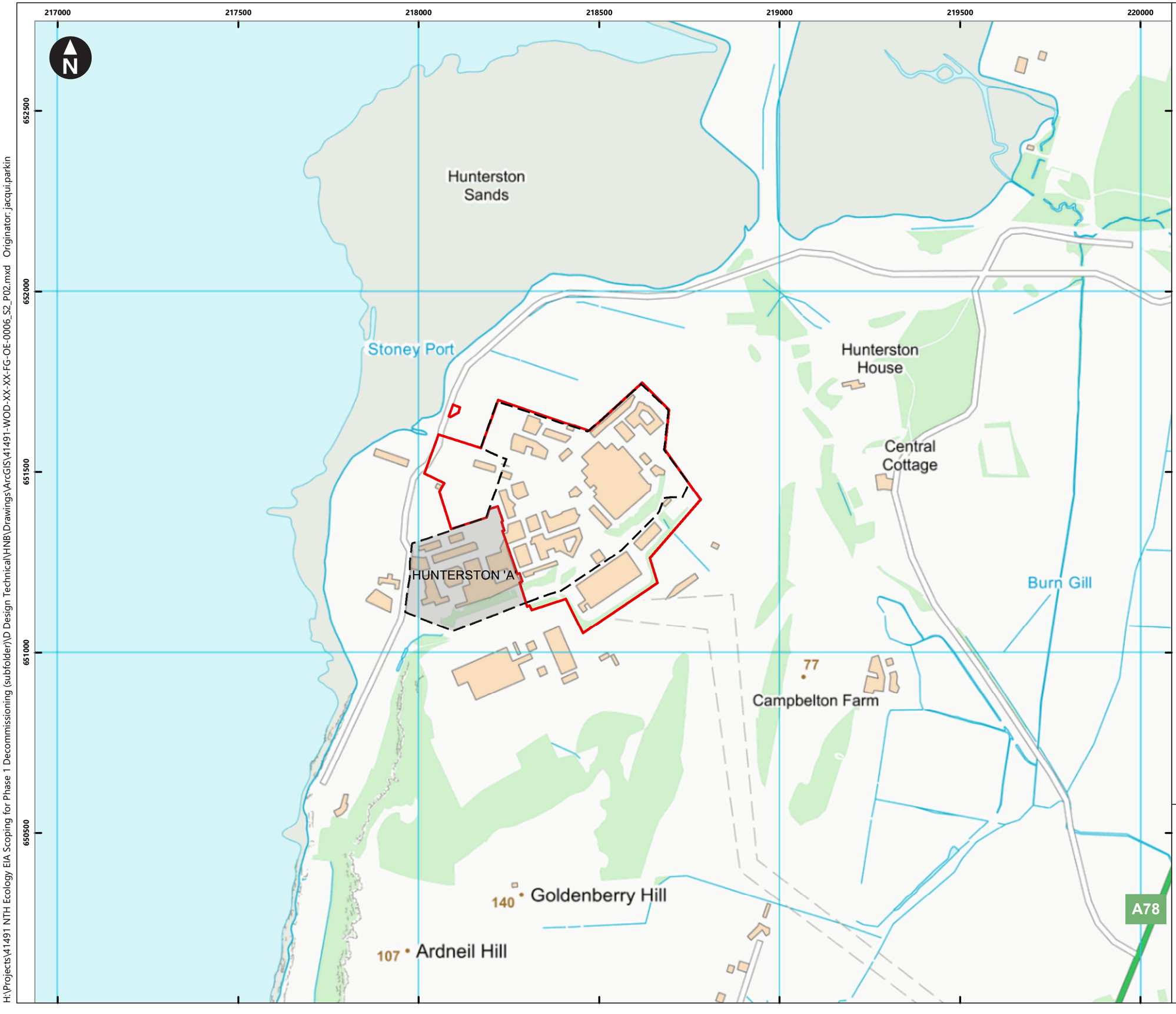
Although Noctule bats are relatively widespread in much of England, Wales and south-west Scotland, this species has become far less common, mainly due to the intensification of agriculture, which can result in loss of feeding habitat, such as permanent pasture, woodland edge and hedgerows. Loss of suitable trees for roosting has also been a contributing factor (BCT 2010b[9]). The UK population size has previously been estimated at 50,000 (Battersby, 2005[10]) and more recent monitoring data (BCT 2017) indicate that noctule populations are now increasing.

No noctule bat roosts were recorded and the habitats within the Study Area are of low suitability for roosting noctules, due to a lack of mature trees, which is the favoured roost habitat of this species. However, noctule foraging and commuting activity was recorded outside of the double security fence, within the 50m perimeter/buffer around the NSL area, in July and September 2019 by static detector monitoring and during the transect survey in July. This indicates that noctules that roost elsewhere forage/commute around the station perimeter.

[9] Bat Conservation Trust (2010b). Species Information Sheets – Noctule

[10] Battersby, J. (Ed) & Tracking Mammals Partnership. 2005. UK Mammals: Species Status and Population Trends. First Report by the Tracking Mammals Partnership. JNCC/Tracking Mammals Partnership, Peterborough

Appendix A
Figures



Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence

0 100 200 300 400 m

Scale at A3: 1:10,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 1.1
Site location plan

October 2019

wood.

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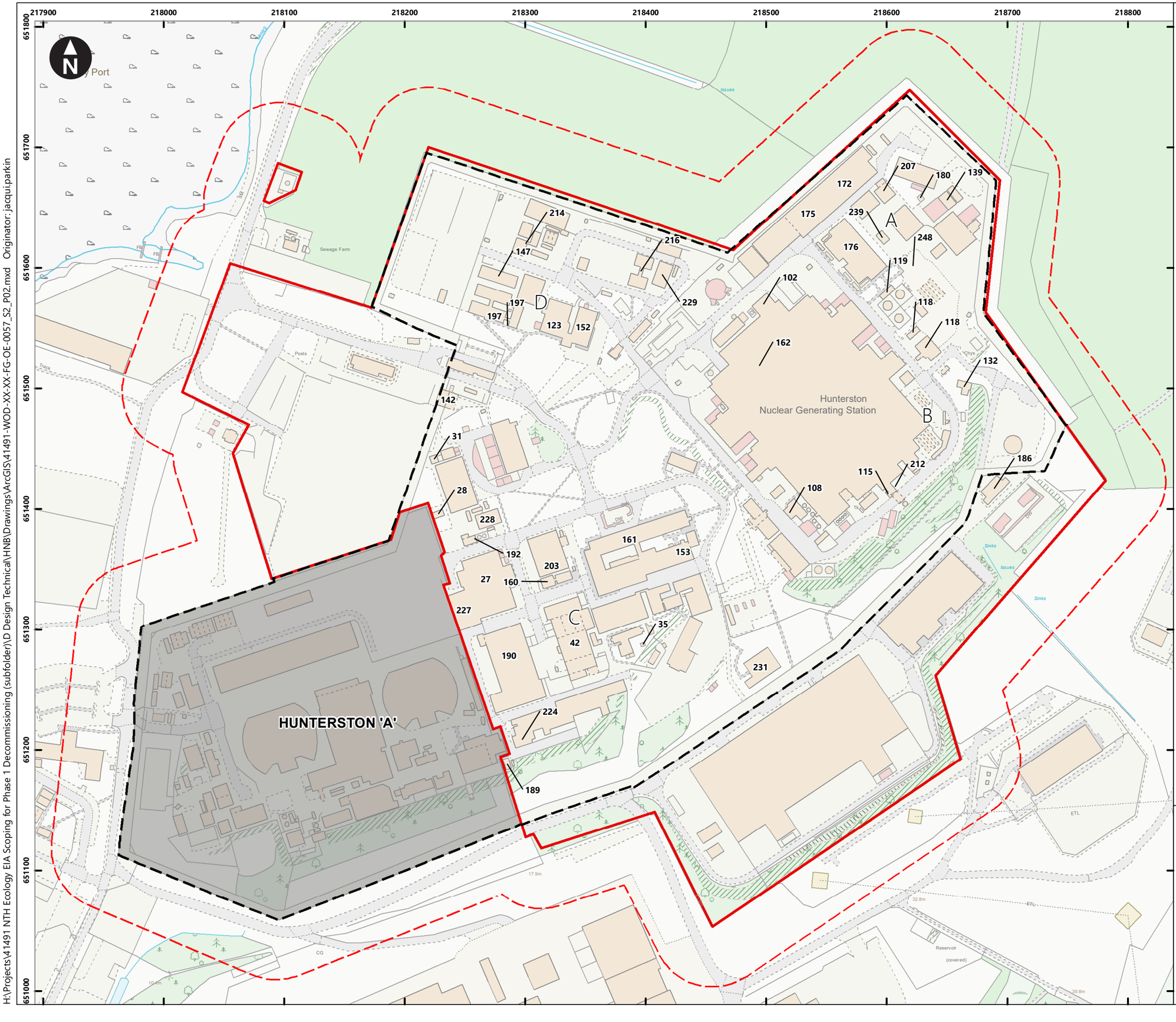

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 2.1
Study area (bats)

November 2019

wood.

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217900 218000 218100 218200 218300 218400 218500 218600 218700 218800

651800 651700 651600 651500 651400 651300 651200 651100 651000

N

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m

Transects for low suitability buildings

- Transect A
- Transect B
- Transect C
- Transect D

Hunterston Nuclear Generating Station

HUNTERSTON 'A'

A B C D

214 216 147 197 197 123 152 229 142 31 28 228 192 203 160 227 27 190 42 161 153 35 224 189 231 162 102 172 175 239 207 180 139 248 176 119 118 118 132 115 212 108 186

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 2.2
Transect surveys of buildings (Low to Negligible roost suitability)

November 2019

wood.

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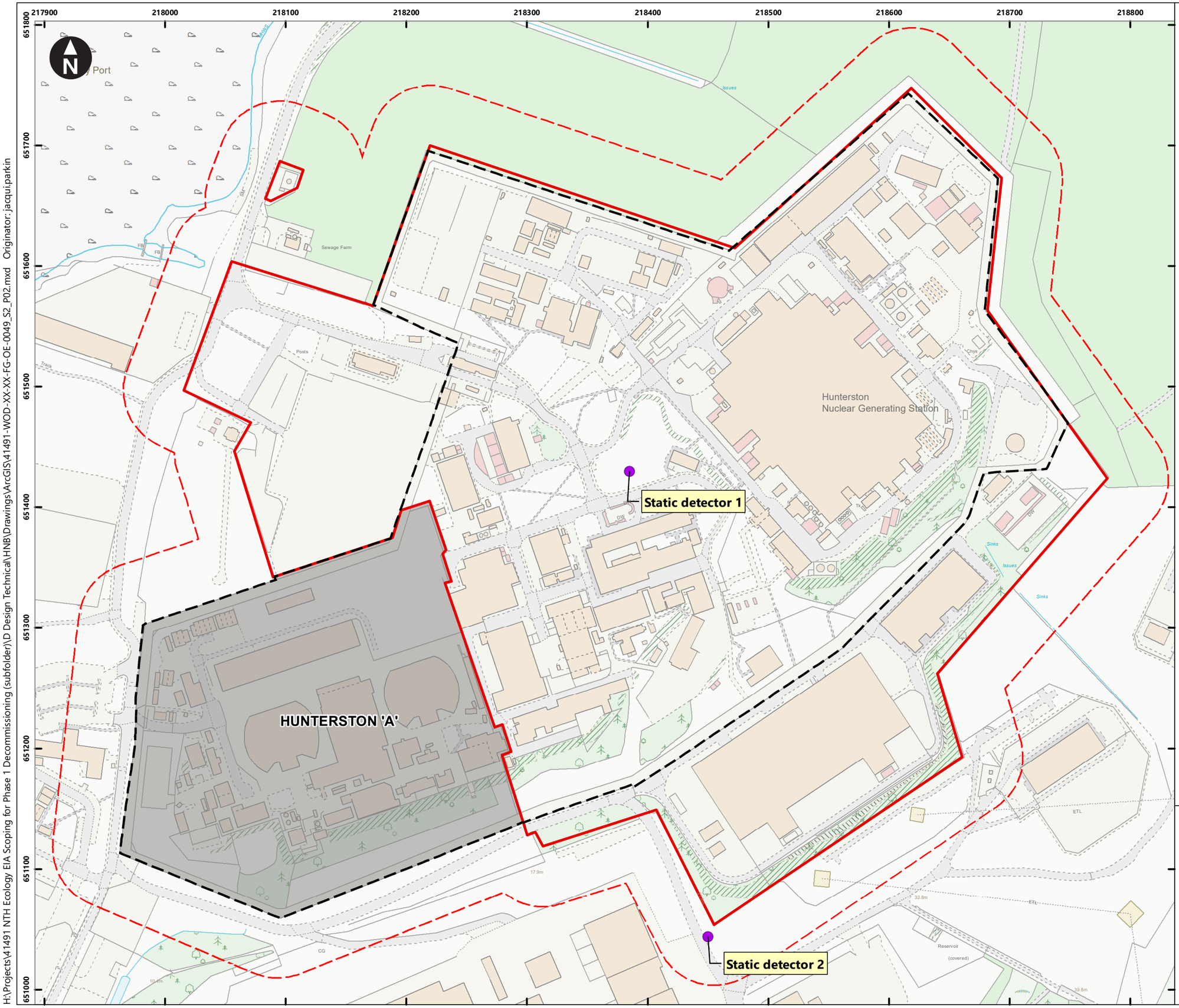

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Static detector

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 2.3
Static detector locations

November 2019

wood.

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217900 218000 218100 218200 218300 218400 218500 218600 218700 218800

651800 651700 651600 651500 651400 651300 651200 651100 651000

N

Stanley Port

Sewage Farm

Posts

Hunterston
Nuclear Generating Station

HUNTERSTON 'A'

214 147 216 229 197 197 123 152 142 31 28 228 192 27 227 203 160 161 153 42 35 190 231 224 189 102 162 172 175 176 207 180 139 239 248 119 118 118 132 115 212 108 186

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m

Bat Roost Suitability

- Moderate
- Low
- Low to negligible

Note: All other buildings have negligible bat roost suitability / no further survey

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.1
Bat roost suitability - buildings

November 2019

wood.

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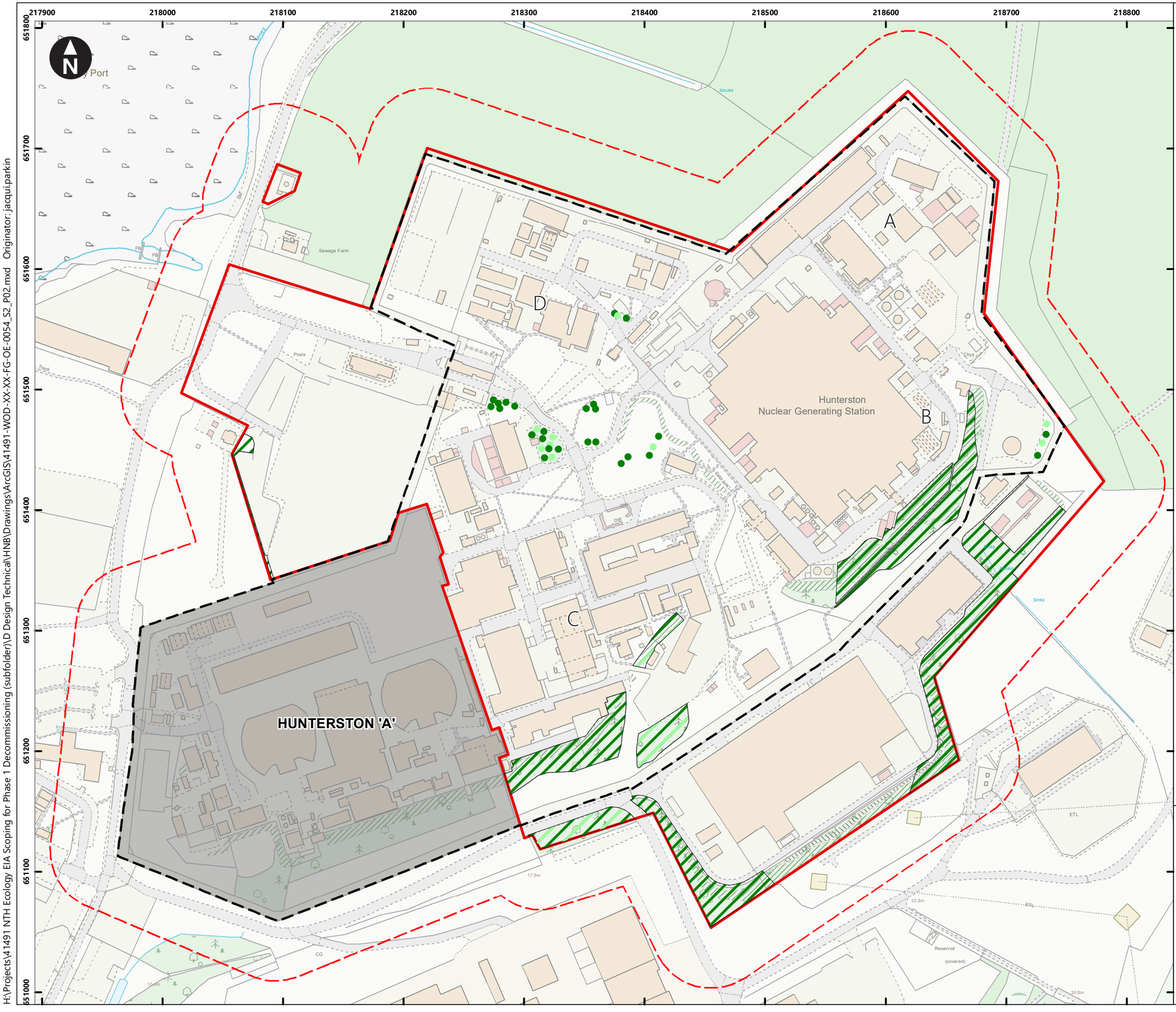

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Parkland and scattered trees- broad-leaved
- Parkland and scattered trees - coniferous
- Broadleaved woodland - plantation
- Mixed woodland - plantation

Note:
All the trees mapped are of low or negligible suitability for roosting bats

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.2
Bat roost suitability - trees

November 2019

wood.

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218000 218100 218200 218300 218400 218500 218600 218700 218800

651800 651700 651600 651500 651400 651300 651200 651100 651000

HUNTERSTON 'A'

Hunterston
Nuclear Generating Station

Sewage Farm

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Transect and direction of walking
- Common pipistrelle
- Soprano pipistrelle

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.3
Bat activity transect survey - May 2019

November 2019

wood.

H:\Projects\41491 NTH Ecology EIA Scoping for Phase 1 Decommissioning (subfolder)\D Design Technical\HNB\Drawings\ArcGIS\41491-WOD-XX-XX-FG-OE-0051_S2_P02.mxd Originator: jacqui.parkin

217900 218000 218100 218200 218300 218400 218500 218600 218700 218800

651800 651700 651600 651500 651400 651300 651200 651100 651000

N

Port

Sewage Farm

Posts

Track

Issues

Sinks

Hunterston
Nuclear Generating Station

HUNTERSTON 'A'

S

F

Reservoir
(covered)

ETL

CG

17.9m

32.8m

39.8m

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Transect and direction of walking
- Common pipistrelle
- Noctule
- Soprano pipistrelle

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.4
Bat activity transect survey - July 2019

November 2019

wood.

H:\Projects\41491 NTH Ecology EIA Scoping for Phase 1 Decommissioning (subfolder)\D Design Technical\HNB\Drawings\ArcGIS\41491-WOD-XX-XX-FG-OE-0052_S2_P02.mxd Originator: jacqui.parkin

217900 218000 218100 218200 218300 218400 218500 218600 218700 218800

651800 651700 651600 651500 651400 651300 651200 651100 651000

N

Port

Sewage Farm

Hunterston
Nuclear Generating Station

HUNTERSTON 'A'

F

S

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Transect and direction of walking
- Common pipistrelle
- Noctule
- Nyctalus sp
- Pipistrellus sp
- Soprano pipistrelle

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.5
Bat activity transect survey - September 2019

November 2019

wood.

Appendix B
Relevant legislation

All bat species in Scotland are afforded legal protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). This makes it an offence to deliberately or recklessly:

- Capture, injure or kill a wild bat;
- Harass a wild bat or group of wild bats;
- Disturb a wild bat in a roost (any structure or place which it uses for shelter or protection);
- Disturb a wild bat while it is rearing or otherwise caring for its young;
- Obstruct access to a bat roost or to otherwise deny the animal use of the roost;
- Disturb a wild bat in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs; and
- Disturb a wild bat in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is an offence of strict liability (i.e. it does not have to be demonstrated that the action was deliberate or reckless) to damage or destroy a bat roost, irrespective of whether it is occupied at the time.

Appendix C
Survey parameters (emergence/re-entry surveys)

Date	Building	Survey	Sunset/ sunrise	Survey Time	Temperature (start and end °C)	Rainfall	Cloud cover	Wind Speed	Moon (% visible)
23/07/19	228	Re-entry	05:09	03:09-05:24	>10	None	<5	Calm	-
23/07/19	228	Re-entry	05:09	03:06-05:24	>10	None	<5	Calm	-
23/07/19	216	Emergence	21:41	21:26-23:35	22-22	None	<5	Calm	-
23/07/19	216	Emergence	21:41	21:26-23:41	>10	None	10	Calm	-
29/07/19	115	Emergence	21:30	21:15-23:30	19-18	None	100	Calm	-
06/08/19	207	Re-entry	05:34	03:34-05:49	16-16	Heavy rain c.20 mins at start of survey	100	light	-
06/08/19	118	Re-entry	05:34	03:34-05:49	16-16	Heavy rain c.20 mins at start of survey	100	Light	-
06/08/19	227	Emergence	21:14	20:59-23:14	20-17	None	100	Calm	-
06/08/19	027	Emergence	21:14	20:59-23:14	20-17	None	100	Calm	-
07/08/19	224	Emergence	21:11	20:56-23:11	20-17	None	<5	Calm	-
07/08/19	231	Emergence	21:11	20:56-23:12	20-17	None	40	Light	50
12/08/19	153	Emergence	20:59	20:44-22:59	16-14	None	50	Calm	100
12/08/19	108	Emergence	20:59	20:44-22:59	16-14	None	50	Calm	100
13/08/19	35	Re-entry	05:47	03:45-05:51	12-12	None	90	Light	100
13/08/19	35	Re-entry	05:47	03:45-05:51	12-12	None	90	Light	100
14/08/19	Multiple (low to negligible suitability)	Re-entry (Transect A and B)	05:47	03:47-06:00	12-12	Light	90	Light	100
15/08/19	Multiple (low to negligible suitability)	Re-entry (Transect C and D)	05:51	03:51-06:06	12	Showers	90	Light	100
20/08/19	152	Re-entry	06:01	04:01-06:16	14-14	None	90	Calm	50

Date	Building	Survey	Sunset/ sunrise	Survey Time	Temperature (start and end °C)	Rainfall	Cloud cover	Wind Speed	Moon (% visible)
20/08/19	229	Re-entry	06:01	04:01-06:16	14-14	None	90	Calm	50
20/08/19	197	Emergence	20:43	20:28-22:43	15-14	None	80	Light	50
20/08/19	142	Emergence	20:43	20:28-22:43	16-16	None	60	Light	50
21/08/19	42	Emergence	20:40	20:25-22:40	17-14	None	60	Moderate	50
21/08/19	212	Emergence	20:40	20:25-22:40	16-14	None	100	Light	
17/09/19	197	Re-entry	06:55	04:55-07:10	12-10	None	30	Light	100
17/09/19	224	Re-entry	06:55	04:55-07:10	14-10	None	80	Light	100

Appendix D
Preliminary Roost Assessment

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
027	Single storey building 30-50 years	Brick	Flat felt roof	No	Small gaps between brickwork above the door on the south side of the building. A gap in the corner of the brickwork at NS 18277 51254. Gaps under roof flashing on north side of the building (e.g. NS 18269 51351)	No	Low
028	Single storey brick building 30-50 years	Brick	Flat felt roof	Metal flashing around roof edge	Small (c.2cm wide) gaps under the felt roof on the north side of the building. Gap between brickwork and roof on east side of the building (visible from north side of building).	No	Low to Negligible
029	Single storey building 30-50 years	Brick	Flat roof	Metal flashing around roof edge	None identified	No	Negligible
031	Single storey building 30-50 years	Brick	Flat roof	Metal flashing around roof edge; Ventilation bricks; Wooden framed windows	Gap above drainpipe on the north side, with a cavity in the brickwork that extends vertically. Extent of cavity not visible from ground level.	No	Low to Negligible
032	Single storey 30-50 years old	Brick	Flat roof	No	None identified	No	Negligible
034	Single storey – Open storage	Brick	Flat roof – plastic	No	None identified	No	Negligible
035	Single storey	Harling	Flat roof	No	Gaps between wall and roof edge	No	Low

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
042	Single storey building 30-50 years	Brick	Flat roof	No	Small gaps between top of wall and roof. Gaps in rusty corrugated iron.	No	Low
043	Single storey 30-50 years	Brick	Flat roof	No	No Features	No	Negligible
046	Single storey 30-50 years	Brick	Flat roof	Ventilation grids and metal case windows	Small gaps at metal casing at garage door	No	Negligible
047	Single storey 30-50 years	Brick, Aluminium	Flat roof	PVC and metal windows	None identified	No	Negligible
048	Single storey 30 years	Brick	Flat roof	PVC window	None identified	No	Negligible
050	Two storeys – portacabin 30 years +	Composite	Flat roof	Metal case windows	Walls sealed, no obvious access points	No	Negligible
051	Single storey 30 years	Brick, aluminium	Flat roof	PVC and metal case windows	Gap beneath doorway (south)	No	Negligible
052	Single Storey portocabin	Metal	Flat roof	None	None identified	No	Negligible
102	Single storey	Brick	Flat roof	None	North east facing hole around chemical storage area	No	Low to Negligible
108	Single storey	Brick	Flat roof	None	Potential access points between wall and roof.	No	Low
111	Single storey	Brick and Aluminium cladding	Flat roof	Ventilations grates	None identified	No	Negligible
115	Two storey	Brick	Flat roof	Ventilation grids	Gaps at corrugated iron along wall	No	Low
116	Single storey	Brick	Corrugated iron	No	None identified	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
117	Single storey 30 years +	Brick	Flat roof	Ventilation grids	Limited access – no suitable access points observed	No	Negligible
118	Single storey 30 years +	Composite cladding	Flat roof	Large ventilation grids	Lots of gaps between metal roof and walls	No	Low
119	Single storey 30 years +	Brick	Flat roof	Doors for access	Holes in lintel above door	No	Low to Negligible
122	Single storey storage building.	Aluminium	Flat roof	None	Limited to none – not suitable.	No	Negligible
123	Single storey 30-50 years	Brick	Flat roof	None	Small gap between brick wall and roof, likely to be well sealed. Full extent not visible from the ground.	No	Low to Negligible
130	Portacabin building comprised of metal. Flat roof.	Metal	Flat roof, metal	None	None identified	No	Negligible
132	Single storey portacabin	Composite cladding, partly brick	Corrugated iron and composite cladding	Ventilation grates	Possible access points within corrugated roof at north facing side	No	Low to Negligible
139	Single storey	Brick	Flat roof	Wooden soffits and small ventilation grates	Gaps between wooden soffits and brick wall	No	Low to Negligible
142	No exterior walls, only metal pillars with a corrugated metal boxed ceiling. Flat, felted roof.	No side walls – metal pillars	Flat, felt roof	No	Gap between pillar and roof in the south corner of the structure.	No	Low
143	Single storey	Brick base with corrugated aluminium	Flat roof	PVC windows	No suitable access points	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
145	Single storey	Brick	Flat roof	PVC windows	No suitable access points recorded	No	Negligible
147	Single storey,	Brick	Flat roof	PVC windows	Multiple features – gap between top of brick wall and roof. Multipole holes/crevices between wall support and roof.	No	Low to Negligible
148	Single storey	Aluminium	Aluminium	Ventilations grids	No suitable access points observed	No	Negligible
151	Single storey	Brick with Aluminium cladding		Large entry door and large ventilation shafts	No suitable access points observed.	No	Negligible
152	Single storey around 50 years old.	Brick	Flat roof	No	Gaps above fire exit door Gaps above garage door and in the wall (for wiring/ piping) on the south-east side of the building	No	Low
153	Single storey 30-50 years	Brick	Flat roof	PVC windows	Gap between soffits and brick wall	No	Low
159	Single storey	Brick	Flat roof	PVC windows	None identified	No	Negligible
160	Two storey portacabin	Harled exterior	Flat roof	Metal framed windows	Lifted boards at the top of the wall.	No	Low to Negligible
161	Single storey 30 years	Brick	Flat roof	Metal frame windows Ventilation gaps	One possible access point – loose brick at west corner of building	No	Low to Negligible
162	Tall structure comprising brick, corrugated metal, glass panels and a flat roof.	Aluminium	Aluminium	No	Gap in brickwork at NS 18542 51385. Corrugated metal sheets on the south side of the building is eroded, creating gaps that may provide potential temporary roosting feature.	No	Low to Negligible
171	Single storey	Brick	Flat	No suitable features recorded	None identified	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
172	Single storey Approximately 30 years old.	Brick	Flat roof	No	Hole in brickwork and gap in flashing on the north side of the building.	No	Low to Negligible
174	Single storey approx. 30 years+	Brick	Flat roof	Metal framed windows, ventilation grates	None identified	No	Negligible
175	Single storey approx. 30 years.	Brick	Flat roof	No	Flashing lifted slightly on the north side of the building.	No	Low to Negligible
176	Single storey 30 years plus	Brick lower level with aluminium cladding at top level	Flat felt roof	Large, multiple metal case windows and ventilation grates	Hole in brick work joining brick and aluminium casing and gap in flashing. North facing.	No	Low to Negligible
177	Single storey Approximately 15 years	Aluminium (no insulation)	Aluminium	Two large garage style doors	None identified	No	Negligible
178	Single storey Approximately 15 years	Aluminium	Aluminium	Large garage style doors	None identified	No	Negligible
179	Single storey building, approximately 30 years old.	Brick	Flat roof	PVC windows Metal flashing Ventilation grates	None visible although metal flashing appears lifted.	No	Negligible
180	Single storey 30 years	Brick	Metal	Metal flashing	Small gaps (2-4cm wide) under wooden boards potentially allowing entry by a bat.	No	Low to Negligible
181	Single storey 30 years	Brick and composite cladding	Flat roof	Metal framed windows	None identified	No	Negligible
184	Single storey	Brick	Flat roof	None	Small hole in aluminium cladding above brick wall.	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
	30 years +						
185	Single storey	Brick	Flat roof	None	None identified	No	Negligible
186	Single storey 30-50 years	Brick	Flat roof	Soffits	Small gaps (2-4cm wide) under wooden boards potentially allowing entry by a bat.	No	Low to Negligible
189	Single storey 30-50 years	Brick	Felt roof	Ventilation grates	Edge of felt roof lifted slightly	No	Low to Negligible
190	Single storey	Brick base, glass top	Flat roof – no visual		Limited access points	No	Low to Negligible
191	Single storey building with a brick base, glass panel surround, and a flat roof.	Brick and glass	Flat roof	None	None identified	No	Negligible
192	Single storey brick 30 years	Brick, metal	Flat roof	No	Gaps in the north-east corner of the building between bricks and metal work.	No	Low to Negligible
193	Single storey 30 years	Brick, glass	Metal	No	None identified	No	Negligible
194	Single storey	Brick	Flat roof	Wooden soffits Metal flashing	None identified	No	Negligible
196	Single storey	Brick	Flat roof	None	None identified	No	Negligible
197	Single storey	Harling	Flat roof	No	Hole in wooden soffit, lifted away from the wall in places. North west facing.	No	Moderate
198	Single storey, a few years old (c.2015)	Metal	Metal	No	None identified	No	Negligible
199	Single storey	Metal	Metal	No	None identified	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
201	Single storey 30-50 years	Brick	Flat roof	Metal framed windows	None identified	No	Negligible
202	Single storey	Brick	Flat roof	No	None identified	No	Negligible
203	Single storey brick building	Brick, glass	Flat roof	No	On the western side of the building a small hole between the brick wall and top of building.	No	Low to Negligible
205	Single storey Estimated age is 30 years.	Brick	Flat roof	No	None identified	No	Negligible
206	Single storey 30-50 years	Brick	Flat roof	None	None identified	No	Negligible
207	2 storeys 30-50 years	Boarding	Flat roof	PVC Windows Ventilations grates	Potential access between roof of ground level and first level portacabin.	No	Low
208	Single storey portocabin	Metal	Metal	Metal case windows	None identified	No	Negligible
209	Single storey	Brick and corrugated metal	Flat roof	No	None identified	No	Negligible
210	Single storey	Brick and corrugated metal	Flat roof	Ventilation grids	None identified	No	Negligible
212	Single storey 30-50 years	Brick	Flat roof – metal sheeting	No	A few gaps between brickwork and flashing	No	Low
214	Single storey	Aluminium	Flat felt roof	No	Gap in felt visible from ground	No	Low to Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
215	Single storey	Plastic coating	Flat felt roof	No	Very well-sealed, no visible entry points at height. There are some gaps at in wall at around 1ft from the ground.	No	Negligible
216	Single storey 30 years	Cement, wood	Flat felt roof	Ventilation grids PVC windows	Broken grate has limited potential. West facing kick board has lots of gaps (potential access). Ventilation grate around roof has a crack Gaps where wall meets roof.	No	Low
217	Single storey	Composite	Composite	No	None identified	No	Negligible
221	Single storey	Brick	Flat roof	No	None identified	No	Negligible
224	Single storey	Brick, harling	Flat roof	No	Good potential access points in wall – 2 inch gap that goes into wider space in south facing wall.	No	Moderate
225	Two storey 30-50 years	Composite	Flat roof	Metal cased windows	None identified	No	Negligible
227	Two storey building	Brick	Metal	No	Vertical gaps in the corner between two buildings.	No	Low
228	Single storey, permanent portacabin building	Wood	Flat roof	No	Gaps (5-10cm wide) in the grate on the west side of the building (e.g. NS 18272 51397). Gaps are also under boards at NS 18272 51397.	No	Low
229	Permanent single storey portacabin	Plaster	Flat roof	PVC windows Ventilation grids	Several cracks in ventilation. Gap at end of wood cladding at roof.	No	Low
231	Single storey portacabin	Composite	Shallow pitched felt roof	No	Gap in roof on the south-west side of the building. Gap in grate on the south side of the building, measuring approximately 2cm wide by 4cm long (e.g. at NS 18493 51250).	No	Low
239	Single storey 30-50 years	Sprayed cement, wood	Flat roof	PVC Windows	Holes in wooden surround between top of wall and roof	No	Low to Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
244	Single storey 30-50 years	Composite	Flat roof	Metal frame windows	None identified	No	Negligible
246	Single storey 1 year old.	Aluminium	Aluminium	No	None identified	No	Negligible
248	Single storey 30-50 years	Brick	Flat roof	No	Holes where cables enter building	No	Low
249	Single storey 30-50 years	Aluminium cladding	Aluminium	No	Small gap above fire exit	No	Negligible

Appendix E
Bat activity (static detectors)

Table E1 Spring (17th to 21st May 2019)

Static Detector Location (Figure 2.2)	No of nights' data	Number of recorded passes by each species (mean number[11])			
		Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus sp.
1	5	5 (1)	2 (0.4)	0	0
2	5	890 (178)	1367 (273)	0	0

Table E2 Summer (20th to 24th July 2019)

Static Detector Location (Figure 2.2)	No of nights' data	Number of recorded passes by each species (mean number)			
		Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus sp.
1	5	14 (2.8)	2 (0.4)	0	0
2	5	275 (55)	141 (28)	41 (8)	1 (0.2)

Table E3 Autumn (4th to 8th September 2019)

Static Detector Location (Figure 2.2)	No of nights' data	Number of recorded passes by each species (mean number)			
		Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus sp.
1	5	11 (2.2)	2 (0.4)	0	0
2	4	273 (68.2)	781 (195.2)	1 (0.2)	0

[11] Numbers in brackets are the mean number of bat passes over then monitoring period.

Table E4 Combined total over the monitoring period

Static Detector Location (Figure 2.2)	No of nights' data	Number of recorded passes by each species (mean number)			
		Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus sp.
1	15	30 (6)	6 (0.4)	0	0
2	14	1473 (105.2)	2289 (163.5)	42 (3)	1 (0.1)

Appendix F
Bat activity (transects)

Table F1 – Bat Activity – Spring (13th May 2019)

Site Name: HNB
Date: 13/05/19
Survey Type: Dusk transect
Sunset: 21:21
Survey Start: 21:17
Survey End: 23:39

Temperature: 16°C
Precipitation: None
Cloud cover: 0
Moon phase: Half moon
Wind speed/direction: Calm

REAL TIME (BST)	LOCATION	SPECIES	BATS (Max No.)	BATS (passes)	BEHAVIOUR	NOTES
22:18	NS 18775 51418	Soprano pipistrelle	1	1	Feeding	Heard only
22:24	NS 18655 51275	Soprano Pipistrelle	1	1		Heard only
22:33	NS 18651 51086	Common pipistrelle	1	1		Heard only
22:44	NS 18413 51092	Soprano Pipistrelle	1	1		Heard only
22:49	NS 18432 51033	Common pipistrelle	1	1		Heard only
23:05	NS 18794 51222	Soprano Pipistrelle	1	1		Heard only
23:11	NS 18650 51247	Soprano Pipistrelle	1	1		Heard only
23:11	NS 18647 51257	Soprano Pipistrelle	1	1		Heard only
23:15	NS 18670 51291	Soprano Pipistrelle	1	1		Heard only

Table F2 Bat Activity – Summer (22nd July 2019)

Site Name: HNB
Date: 22/07/19
Survey Type: Dusk transect
Sunset: 21:45
Survey Start: 21:55
Survey End: 00:15

Temperature: 18°C
Precipitation: None
Cloud cover: 50%
Moon phase: Not visible
Wind speed/direction: Light

REAL TIME (BST)	LOCATION	SPECIES	BATS (Max No.)	BATS (passes)	BEHAVIOUR	NOTES
22:20	NS 18671 51718	Soprano pipistrelle	1	1		Heard only
22:20	NS 18687 51700	Soprano pipistrelle	1	1		
22:20	NS 18692 51697	Soprano pipistrelle	1	Multiple	Feeding	Feeding alongside hedgerow at field edge.
22:21	NS 18692 51696	Soprano pipistrelle	1	1		Heard only
22:21	NS 18691 51698	Soprano pipistrelle	1	1	Commuting	Heard only
22:22	NS 18692 51695	Soprano pipistrelle	1	1	Commuting	Heard only
22:22	NS 18690 51697	Soprano pipistrelle	1	1	Commuting	Heard only
22:23	NS 18689 51697	Soprano pipistrelle	1	1	Commuting	Heard only
22:23	NS 18694 51697	Common pipistrelle	1	1	Commuting	Heard only
22:23	NS 18694 51695	Soprano pipistrelle	1	1	Commuting	Heard only
22:42	NS 18771 51242	Soprano pipistrelle	1	1	Commuting	Heard only
22:42	NS 18771 51242	Soprano pipistrelle	1	1	Commuting	Heard only

Site Name: HNB
Date: 22/07/19
Survey Type: Dusk transect
Sunset: 21:45
Survey Start: 21:55
Survey End: 00:15

Temperature: 18ºC
Precipitation: None
Cloud cover: 50%
Moon phase: Not visible
Wind speed/direction: Light

REAL TIME (BST)	LOCATION	SPECIES	BATS (Max No.)	BATS (passes)	BEHAVIOUR	NOTES
22:43	NS 18787 51229	Soprano pipistrelle	1	1	Commuting	Heard only
22:47	NS 18804 51148	Soprano pipistrelle	1	1	Commuting	Heard only
22:54	NS 18634 51092	Common pipistrelle	1	1	Commuting	Heard only
23:09	NS 18629 51097	Soprano pipistrelle	1	1	Commuting	Heard only
23:10	NS 18643 51108	Noctule	1	1	Commuting	Heard only
23:19	NS 18675 51236	Common pipistrelle	1	1	Commuting	Heard only
23:23	NS 18697 51323	Soprano pipistrelle	1	1	Commuting	Heard only
23:27	NS 18776 51417	Common pipistrelle	1	1	Feeding	
23:31	NS 18727 51523	Soprano pipistrelle	1	1	Commuting	

Table F3- Bat Activity – Autumn (16th September 2019)

Site Name: HNB
Date: 16/09/19
Survey Type: Dusk transect
Sunset: 19:34
Survey Start: 19:30
Survey End: 21:30

Temperature: 13 - 15°C
Precipitation: None
Cloud cover: 20%
Moon phase: Full moon
Wind speed/direction: Calm

REAL TIME (BST)	LOCATION	SPECIES	BATS (Max No.)	BATS (passes)	BEHAVIOUR	NOTES
20:13	NS 18688 51314	Common pipistrelle	1	1	Feeding	Single pass along edge of treeline
20:15	NS 18688 51314	Soprano pipistrelle	1	4	Feeding	Multiple passes along edge of treeline
20:27	NS 18376 51146	Pipistrelle sp	1	3	Feeding	-
20:40	NS 18504 51086	Nyctalus sp	1	2	-	-
20:41	NS 18442 51070	Soprano pipistrelle	1	1	-	-
20:58	NS 18644 51266	Pipistrelle sp	1	3	-	-

Appendix 7F.

Baseline Report: Breeding and Non-Breeding Birds

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Breeding and Non-breeding Birds

Wood Environment & Infrastructure Solutions UK Limited –September 2020

Report for

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Document revisions

No.	Details	Date
1	Draft	April 2020
2	Final	September 2020

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy proposes to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under Town and Country Planning (Scotland) Act 1997 (TCPA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999, as amended, and EURATOM Article 37 (or an equivalent),

The current strategy is for an Environmental Impact Assessment to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the bird surveys undertaken to inform the EIA of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the bird survey methods, results and conclusions.

1.2 Scheme Description

Decommissioning at HNB is expected to commence in 2023. The Site location is shown in **Appendix A**, **Figure 1.1.** The decommissioning process will begin with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over approximately a 15-year period there will be a process of safe storage and management of intermediate and low-level waste, with intermediate-level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure – a clad, steel framed structure based around the reactor building – will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance - will involve ongoing site/station care and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the site will operate similar to a conventional construction/demolition site.

1.3 Site Context

The HNB site ('The Site' or 'the Station') is in West Kilbride, North Ayrshire, situated on the Firth of Clyde. The centre of the station is at approximate National Grid Reference (NGR) NS 184 514 and the area that is subject to the Nuclear Site Licence (NSL) extends to approximately 30ha. The majority of the station is built structures and hard standing (mainly access and car parks). Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study Area

The Site includes the land inside the HNB double security fence and the additional land that is covered by the HNB Nuclear Site Licence (NSL). The Study Area includes the Site and the land within 100 m of the Site (and HNA), to include territories of birds that breed outside the Site and use habitats within the Site for foraging. The Study Area was extended for non-breeding birds to a 500 m (radius) perimeter area (buffer) around the Site (and HNA). The Study Area is marked on **Figure 2.1**, **Appendix A** and is defined on a precautionary basis to encompass those areas within which birds are most likely to be susceptible to the effects of the HNB decommissioning project.

2.2 Desk Study

A desk-based study was undertaken to collate and review existing information on ecological features that are known to occur, or have previously been recorded, on land within and surrounding the Study Area defined in **Section 2.1**. These features include sites designated for biodiversity conservation; habitats of importance for biodiversity conservation; and legally protected and/or otherwise important species (including birds). The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]). The elements of the desk study that are relevant to ornithology are summarised below and are expanded to include additional ornithology data.

The categories of ornithological features that could be significantly affected by the HNB Decommissioning Project are summarised below. These are the sites (designated for birds) and bird species that are of sufficient biodiversity conservation importance that impacts on them could result in significant effects:

- Statutorily designated biodiversity conservation sites of national and international importance (statutory biodiversity sites):
- Important bird species:
  - Species of principal importance for the conservation of biological diversity in Scotland - these species are included on the Scottish Biodiversity List[1] (SBL);
  - Bird species on the Birds of Conservation Concern (BoCC) Red List[2] (Eaton et al 2015).
- Legally protected bird species, including those species that are afforded enhanced protection through inclusion on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended in Scotland).

The area over which ornithological features may be subject to significant effects, as a result of the HNB Decommissioning Project, is referred to as the potential 'Zone of Influence' (Chartered Institute of Ecology

[1] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation (https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL)

[2] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A, Gregory, R.D. (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746

and Environmental Management ([CIEEM], 2018[3]), which varies for different ornithological features depending on their sensitivity to environmental change together with the nature of the proposed works. The extent of the desk-based study was therefore expanded around the Site on a precautionary basis, informed by the professional judgement of experienced ornithologists and good practice guidance (e.g. CIEEM, 2018):

- The locations of statutory biodiversity sites of ornithological importance within 10 km of the Site, extended to 20 km for sites of international importance (SPAs and Ramsar sites) and 200 km for sites of international importance for particularly mobile sea bird species, were obtained from the Multi-Agency Geographical Information for the Countryside (MAGIC) website[4]. Details of cited features of designated sites were obtained from the JNCC website[5] and Scottish Natural Heritage website[6];
- Data on breeding colonies/sites located within 10 km of the Site was extracted from the JNCC Seabird Monitoring Programme online database[7]; and
- Bird records and details of any non-statutory biodiversity sites of importance for the conservation of birds within 3 km of the Site were obtained from the South West Scotland Environmental Information Centre (SWSEIC).

This desk study also includes information from the following sources:

- Hunterston Integrated Land Management Plan (ILMP)[8], which includes details of bird species recorded within the Study Area;
- Ayrshire County Bird Reports (2014[9] and 2015-16[10]); and
- Wetland Bird Survey (WeBS) core count data obtained from the British Trust for Ornithology[11] (BTO) for survey sectors within 5 km of the Site.

The nomenclature in this report follows that of the British Ornithologists' Union (BOU) 2017. A list of the species referred to in this report (including scientific names) is included in **Appendix B**. Details of relevant legislation and policy pertaining to birds in Scotland (and the UK) is provided in **Appendix C**.

2.3 Breeding Bird Survey

Survey objectives

All UK breeding bird species are legally protected, with species listed on Schedules 1, 1A and A1 of the Wildlife and Countryside Act 1981 as amended in Scotland receiving additional protection from disturbance (**Appendix C**). A number of bird species are also identified by Scottish Ministers as Species of Principal Importance for the Conservation of Biodiversity in Scotland and as such are included on the SBL. The

[3] Chartered Institute of Ecology and Environmental Management (CIEEM). (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Chartered Institute of Ecology and Environmental Management, Winchester.

[4] https://magic.defra.gov.uk/ (accessed 13 August 2019)

[5] https://jncc.gov.uk/our-work/list-of-spas/ (accessed 13 August 2019).

[6] https://sitelink.nature.scot/site/1228#features (accessed 13 August 2019).

[7] (http://archive.jncc.gov.uk/smp/help.htm#browsesites, accessed 13 August 2019).

[8] EDF Energy Nuclear Generation Ltd (2017). Hunterston Integrated Land Management Plan.

[9] Simpson, F.S. [ed] (2017). Ayrshire Bird Report 2014. Scottish Ornithologists' Club, Ayrshire Branch.

[10] Dick, A.M. [ed] (2019). Ayrshire Bird Report 2015 and 2016. Scottish Ornithologists' Club, Ayrshire Branch.

[11] https://app.bto.org/webs-reporting

potential effects of development on breeding bird species are therefore a material consideration in determining planning applications.

The purpose of the breeding bird survey was to collect data to describe the breeding bird community within the Study Area and estimate the number of territories/ breeding pairs of each species within this area. These surveys derive the baseline status of breeding birds within the Study Area, against which the predicted effects of the HNB Decommissioning Project on this group of species will be assessed. Where necessary the survey data will also inform plans to mitigate the effects of the HNB Decommissioning Project on birds.

Data collection locations

The survey targeted suitable habitats for breeding birds within the Study Area (**Figure 2.1, Appendix A**). Areas inside the double security fence were surveyed from its perimeter. Areas outwith the EDF landholding were surveyed from publicly accessible locations (e.g. footpaths, roads). The survey also covered potentially suitable nest sites for Schedule 1 bird species, for example tall, built structures within the Site are potentially suitable nest sites for peregrine. Both the breeding (100m perimeter) and non-breeding (500m perimeter) bird survey areas are marked on **Figure 2.1**.

Data collection methods

A territory mapping survey based on the BTO Common Bird Census (CBC) methodology (Marchant[12] and Gilbert *et al*[13]) was carried out throughout the Study Area between April and July 2019. Eight to ten survey visits are standard for long term monitoring of CBC sites, however where territory mapping is used to inform an assessment of potential environmental impacts, six visits are sufficient to determine the numbers and distribution of breeding bird territories.

The surveys were undertaken until midday (at the latest), in appropriate weather conditions (avoiding periods of strong wind and/or heavy rain). A different route was used by each surveyor on each survey visit to ensure that certain parts of the Study Area did not receive greater survey effort at certain times of day, recognising that there tends to be a decline in bird song later in the morning. The location of each bird detected (visually and/or aurally) was mapped using standard two-letter BTO Codes and bird activity was recorded using standard behaviour codes (Marchant, 1983).

Data analysis

Survey results were collated and analysed, including mapping indicative territory centre-points, across all survey visits. Territory mapping analysis was based on criteria adapted from Amar *et al.* 2006**.** The territory mapping involved an experienced ornithologist looking for spatial groupings of song and other registrations indicative of potential breeding. The presence of a singing/displaying bird, or a pair of birds in potential nesting habitat (in any location on two or more survey dates), were treated as signifying a breeding territory. This data was used to determine the number and distribution of species and overall breeding assemblage within the Study Area.

For breeding gulls and jackdaw, the number of breeding pairs was taken as the maximum number of pairs observed on the power station building roofs on any single visit. The territory locations were derived from a combination of each visit map (CBC methodology) and the locations do not represent specific nest locations. The term 'territory' applied in this report denotes that a pair of breeding birds was present, or that a male was holding territory in that area.

[12] Marchant, J.H. (1983). Common Birds Census instructions. BTO, Tring

[13] Gilbert, G., Gibbons, D.W., AND Evans, J. (1998). Bird Monitoring Methods. RSPB.

2.4 Non-breeding Bird Survey

Survey objectives

There is the potential for important numbers of non-breeding birds to occur within the Study Area, particularly along the coastline adjacent to the Site. The purpose of the non-breeding bird survey is to collect data on the type and level of use of the Study Area by non-breeding birds. Data was also collected on the type and frequency of potential bird disturbance events and the level of response by birds to these events. These surveys derive the baseline status of non-breeding birds within the Study Area, against which the predicted effects of the HNB Decommissioning Project on this group will be assessed. Where necessary these survey data will also inform plans to mitigate the effects of the HNB Decommissioning Project on birds.

Data collection location

The non-breeding bird survey targeted suitable habitats (terrestrial, intertidal and inshore waters) for non-breeding birds within approximately 500m of the Site, which were surveyed from an observation point that was selected to optimise views of the survey area. This 500m perimeter (and observation point) is marked on **Figure 2.1**, along with the breeding bird survey area.

Data collection methods

Distribution and abundance surveys

Two survey visits were undertaken each month from October 2019 to March 2020 inclusive (12 survey visits in total), each one completed on a single day. The two visits were approximately two weeks apart, where possible covering a high tide and low tide period respectively. At least one survey visit included a dawn period, and another, a dusk period. The surveys targeted the following:

- All waterbird and seabird species;
- All bird of prey species;
- All bird species listed on:
  - Annex I of the Birds Directive;
  - Scottish Biodiversity List; and
  - BoCC Red and Amber lists.
- Congregations of ten or more individuals of other species; and
- Other locally scarce species.

Where time permitted the presence of other, non-target species was recorded.

During each survey visit, the surveyor walked a series of transect routes throughout the Study Area, counting all target species observed, with areas inside the double security fence surveyed from its perimeter (**Figure 2.1, Appendix A**). Areas outwith the EDF landholding were surveyed from publicly accessible locations (e.g. footpaths, roads).

Each habitat compartment within the Study Area was assigned a unique number to which sightings of target species were attributed. Each habitat compartment covered a block of woodland, a single field (or group of small fields), a block of buildings and associated hard standing, a stretch of watercourse and/or a defined stretch of intertidal habitat. During each survey visit, details of the birds observed were recorded:

- Species code (BTO 1-2 letter code);
- Number of individuals;
- Habitat compartment (number);
- Habitat type (**Appendix D**);
- Activity code -
  - **a** - Feeding/foraging (on the ground or in the air),
  - **b** - Loafing or preening,
  - **c** – Roosting,
  - **d** - Commuting (flying over the area – but not aerial hunting),
  - **e** - Landed (seen to land within survey area, but activity thereafter not established),
  - **f** - Flushed (seen to take flight from within survey area, activity beforehand not established),
  - **Other** (specified by the observer);
- Notes - other relevant details, such as direction of flight, sex, age, disturbance events and bird responses and (time-permitting) a list of non-target species.

The locations of any congregations of birds on terrestrial and intertidal/inshore habitats (particularly groups of foraging or roosting waders/ wildfowl), were marked on the Field Recording Map.

Disturbance monitoring

As well as recording disturbance events observed during the distribution and abundance surveys, disturbance events and bird responses were monitored for a one hour period on each survey visit, from an Observation Point (**Figure 2.1, Appendix A**) that optimised views of intertidal habitats within the Study Area. Disturbance monitoring targeted all waterbird and seabird species excluding gulls, recognising that coastal areas often support important non-breeding assemblages of waders and waterfowl. All potential disturbance agents (PDAs) and responses by target species were recorded:

- Time of PDA;
- PDA code/disturbance stimuli (**Table 2.1**);
- Bird species;
- Number of individuals that responded;
- Distance range of responding birds to PDA (i.e. 200-300m);
- Level of response -
  - **Level 5** – Flushed (movement of > 500m),
  - **Level 4** - Flushed (movement of > 100m),
  - **Level 3** - Movement < 100m (e.g. within an area of mud, feeding or roosting area),
  - **Level 2** - Behavioural change (e.g. alarm call/posture, change in feeding/roosting activity),
  - **Level 1** - No response;
- Notes – e.g. where the birds flew to, duration of disturbance; activity beforehand.

The same details were recorded for birds that exhibited no response to a PDA (Level 1) within 500m of them (reduced to 200m for walkers with and without dogs, birdwatchers, joggers and cyclists) to determine any indication that birds are showing signs of habituation to disturbance.

Table 2.1 Disturbance stimuli

PDA Code	Stimuli description
HUMAN RECREATION	
WD	Walker(s) with controlled dogs(s) in close proximity, on or off-lead
UN	Uncontrolled dog(s) – off-lead
WK	Walker(s) without dogs
BW	Birdwatcher(s)
JO	Jogger(s)
FI	Fishermen
BD	Bait digger(s)
HR	Horse-rider(s)
CY	Cyclist(s)
KS	Kite or wind surfer(s)
VESSELS	
LB	Large boat/ ship
SB	Speed boat
JS	Jet-ski
SA	Sailing boat or other small craft (not speed boat)
AIRCRAFT	
AC	Large commercial jet (under 1,000m)
LA	Light aircraft (under 1,000m)
ML	Micro-light
HC	Helicopter (under 1,000m)
OTHER STIMULI	
TD	Tidal disturbance: natural response to rising tide (i.e. birds reacting to the incoming tide and rising water levels with no other disturbance visible)
VE	Any vehicle (e.g. car, tractor, quad bike)
CN	Construction noise
GN	Gun-shot (rough soothing, wildfowling, organised shoot)

PDA Code	Stimuli description
PD	Disturbance from a predator (e.g. fox, peregrine, merlin etc).
UN	Unknown disturbance (e.g. when a flock flies/ reacts without any perceived disturbance)
OT	Other identified disturbance stimuli type.

2.5 Constraints

Breeding bird survey

The CBC method identifies numbers of territory-holding birds during the breeding season and does not confirm that breeding has taken place at locations within the Study Area, which would require nests with eggs/young to be identified for many species. The latter is not required to inform the EIA.

Disturbance monitoring

Quantifying background disturbance is difficult as around 29% of all disturbance events were recorded as having an unknown cause. Some predatory events may have gone undetected and the origin of other disturbance events may simply have been a result of a nervous flock responding to conspecifics taking flight or alarming in response to no specific stimulus. It is also the case that it is more likely that a surveyor would record an event that causes birds to take flight (level 3-5 responses) as they are more obvious than an event that would cause birds to become alert or offer no response at all (level 1 and 2 responses).

3. Results

3.1 Desk Study

Designated biodiversity sites (ornithological importance)

There are no statutory biodiversity sites designated for birds within 10 km of the Site. There are two statutory sites (designated for birds) of international importance within 20 km (**Figure 3.1, Appendix A**):

- **Renfrewshire Heights SPA** and SSSI (covering 8,498 ha) is 11.5 km north-east of the Site and is designated for its breeding population of hen harrier (averaging 10 breeding females during 1998-2004); and
- **Arran Moors SPA** (covering 10,802 ha) is 17.3 km west of the Site and is designated for its breeding population of hen harrier (averaging 24 breeding females and representing at least 4.8% of the breeding population in Great Britain (1998 National Survey).

There are 13 SPAs within 200 km of the Hunterston B site that contain marine seabird qualifying features: Ailsa Craig, Laggan, North Colonosay and Western Cliffs, Rathlin Island, Sheep Island, Larne Lough, Treshnish Isles, Rum, Canna and Sanday, Outer Ards, Strangford Lough, Belfast Lough. The foraging range of qualifying features from three sites overlap the Study Area, however these species primarily forage in the wider offshore environment, beyond the marine elements of HNBs infrastructure:

- **Ailsa Craig SPA** is approximately 51 km to the south-west and the foraging range of two of its qualifying features (breeding gannet and lesser black-backed gull) overlap the Study Area;
- **Rathlin Island SPA** is approximately 91 km to the south-west and the foraging range of six of its qualifying features (breeding common guillemot, fulmar, herring gull, lesser black-backed gull, manx shearwater and puffin) overlap with the Study Area; and
- **Rum SPA** is 154 km to the north-west and the foraging range of a single qualifying feature (breeding manx shearwater) overlaps the Study Area.

There are no non-statutory biodiversity sites designated specifically because of their ornithological importance within 3km of the Site.

Species records and monitoring data

Breeding Bird Surveys (EDF)

Breeding bird surveys were undertaken within the EDF landholding at Hunterston B in 2002, 2003 and 2011, and have been completed biennially since 2015. In 2019 (the most recent survey for which results are currently available), five survey visits were carried out from April-June. **Table E.1 (Appendix E)** summarises the number of territories/ breeding pairs recorded within the EDF landholding at HNB since 2011.

Non-breeding Bird Surveys (EDF)

Monthly (October 2018 to March 2019) non-breeding bird surveys were undertaken within the EDF landholding at Hunterston B by Clyde Ecology Ltd. This represents the third set of winter surveys, with previous surveys having been completed during the winters of 2014-15 and 2016-17 respectively. **Table E.2 (Appendix E)** shows the peak count of each species recorded within the EDF landholding at HNB in Winter 2018/19.

Seabird Monitoring Programme (JNCC)

The Seabird Monitoring Programme (SMP) is an ongoing annual monitoring programme, established in 1986, of 25 species of seabird that breed regularly in Britain and Ireland. **Table E.3 (Appendix E)** summarises the SMP counts of breeding seabird species (in pairs) for colonies within 10 km of the Site. The colonies are shown in order of their approximate distance from the Site boundary to the centre of the colony. The number of pairs is shown for the period in which the last full seabird census was carried out in 1998-2002 (Mitchell *et al.*, 2004) and any counts undertaken in the past five years (since 2014).

SWSEIC Data

SWSEIC hold a large number of records of bird species, including species of conservation concern, potentially within or close to the Site since 2009. **Table E.4 (Appendix E)** summarises the records of species of notable conservation status[14], potentially occurring within/near the Site (within NGR 1km square NS1851 or 2km tetrad square NS15V) since 2009, split by breeding season (April-July) and non-breeding season (August-March).

Wetland Bird Survey

The Wetland Bird Survey (WeBS) is the monitoring scheme for non-breeding waterbirds in the UK (coordinated by the BTO), which aims to provide the principal data for the conservation of their populations and wetland habitats. **Table E.5** (**Appendix E**) summarises average peak counts of bird species by count sector within 5km of the Site. A 5-year mean figure is used where available, although for some count sectors only a shorter timeframe is available. Any species that was recorded singly only once over the 5-year period is excluded. **Figure 3.2** shows the location of the WeBS count sectors within 5km of the Site.

3.2 Breeding Bird Survey

The survey parameters (dates, times and weather conditions) are included in **Table F1, Appendix F**. A total of 52 species were recorded during the breeding bird survey and there was evidence of breeding/holding territory within the Study Area by 27 of these species (**Figure 3.3a**, **Figure 3.3b** and **Table 3.1**):

- Lesser black-backed gull, a qualifying feature of Ailsa Craig SPA and Rathlin Island SPA for its breeding populations, was recorded breeding on the Site;
- Herring gull, a qualifying feature of Rathlin Island SPA for its breeding population, was recorded breeding on the Site;
- No species listed on Annex I of the Birds Directive;
- No species listed on Schedule 1 of the Wildlife & Countryside Act 1981 as amended in Scotland;
- Six species on the Scottish Biodiversity List (dunnock, herring gull, house sparrow, linnet, reed bunting and song thrush);
- Four species listed on the Birds of Conservation Concern (BoCC) red-list (Eaton et al., 2015) (herring gull, house sparrow, linnet and song thrush); and

[14] Species listed in the Wildlife & Countryside Act 1981 as amended in Scotland (on Schedules 1, 1A and A1), Annex I of the Birds Directive, the Scottish Biodiversity List and BoCC red-list (Eaton *et al.*, 2015).

- Seven species on the BoCC Amber-list (dunnock, house martin, lesser black-backed gull, meadow pipit, oystercatcher, reed bunting and willow warbler).

The number of breeding pairs of herring gull, lesser black-backed gull and jackdaw breeding on the power station buildings (within the Study Area) was estimated from the maximum number of pairs seen on any single visit (**Table G1, Appendix G**).

Table 3.1 Breeding bird territories recorded within the Study Area (2019)

BTO species code	Species	No. territories within Study Area	Scottish Biodiversity List	BoCC (Red/Amber)
B.	Blackbird	8		
BT	Blue tit	4		
C.	Carrion crow	1		
CH	Chaffinch	4		
CT	Coal tit	1		
CD	Collared dove	1		
D.	Dunnock	3	Yes	Amber
GO	Goldfinch	3		
GT	Great tit	2		
HG	Herring gull	12	Yes	Red
HM	House martin	1		Amber
HS	House sparrow	7	Yes	Red
JD	Jackdaw	10		
LB	Lesser Black-backed gull	6		Amber
LI	Linnet	2	Yes	Red
MG	Magpie	2		
MP	Meadow pipit	3		Amber
OC	Oystercatcher	2		Amber
PW	Pied wagtail	3		
RB	Reed bunting	1	Yes	Amber
R.	Robin	4		
SW	Sedge warbler	2		
ST	Song thrush	1	Yes	Red

BTO species code	Species	No. territories within Study Area	Scottish Biodiversity List	BoCC (Red/Amber)
WH	Whitethroat	1		
WW	Willow warbler	5		Amber
WP	Woodpigeon	1		
WR	Wren	5		

A further 25 species were recorded during the breeding bird survey for which no evidence of breeding/ holding territory was recorded. The total number of each non-breeding species recorded on each visit is included in **Table G.2 (Appendix G)**. All of these species breed in Ayrshire (Simpson [ed], 2017) and the Study Area provides potentially suitable breeding habitat for a number of them:

- **Built areas**: kestrel, starling, stock dove and swallow;
- **Trees and scrub:** blackcap, mistle thrush and pheasant; and
- **Grassland and coastal habitat:** wheatear, shelduck and eider.

3.3 Non-breeding Bird Survey

Distribution and Abundance

The survey parameters (dates, times and weather conditions) are included in **Table F.2 (Appendix F)**. A total of 8,386 individuals across 80 species were recorded during the non-breeding bird survey (**Table H.1, Appendix H**). The majority (73%) of species observations were within habitat compartments 2, 3 and 10, which are coastal habitats (**Figure 2.1** and **Table 3.2**). There was only a single bird recorded in each of habitat compartment numbers 26, 32 and 33 (improved and semi-improved grassland). Bird activities within the Study Area primarily consisted of feeding and foraging, loafing and roosting.

Table 3.2 Habitat compartments with the highest numbers of non-breeding bird observations*

Habitat compartment (Figure 2.1)	Total observations*	% of all observations	Feeding / foraging (total)	Loafing (total)	Roosting (total)
2	311	36.33	105	67	49
10	255	29.79	136	10	92
3	58	6.78	8	5	34
11	31	3.62	24	2	5
14	28	3.27	17	2	5
18	23	2.69	11	1	5
4	20	2.34	3	1	1

Habitat compartment (Figure 2.1)	Total observations*	% of all observations	Feeding / foraging (total)	Loafing (total)	Roosting (total)
19	14	1.64	6	3	4
7	13	1.52	11	1	-
9	12	1.40	9	-	-

* Each observation is a record of a species on single survey date, for example a record of 5 herring gulls and 6 lesser black-backed gulls on a single survey date, followed by 7 and 9 respectively on the next survey date, would represent a total of four observations.

A total of 55 target species were recorded:

- **Seven** species are listed on Annex I of the Birds Directive (bar-tailed godwit, dunlin, golden plover, peregrine, red-throated diver, shag and whooper swan);
- **Twenty** species are on the Scottish Biodiversity List (bar-tailed godwit, black-headed gull, bullfinch, dunlin, dunnock, golden plover, herring gull, house sparrow, kestrel, lapwing, linnet, peregrine, red-throated diver, redwing, reed bunting, skylark, song thrush, starling, twite and whooper swan);
- **Fifteen** species are listed on the Birds of Conservation Concern (BoCC) red-list (curlew, fieldfare, grey wagtail, herring gull, house sparrow, lapwing, linnet, mistle thrush, redwing, ringed plover, shag, skylark, song thrush, starling and twite); and
- **Twenty-nine** species are on the BoCC Amber-list (black guillemot, black-headed gull, bullfinch, common guillemot, common gull, dunlin, dunnock, eider, goldeneye, great black-backed gull, greenshank, greylag goose, kestrel, knot, lesser black-backed gull, mallard, meadow pipit, mute swan, oystercatcher, redshank, reed bunting, shelduck, snipe, stock dove, teal, turnstone, whooper swan and wigeon).

Details of the monthly peak counts of target species and the habitat compartments where the peak counts were recorded are presented in **Table 3.3.**

Table 3.3 Peak monthly counts of target species and location (habitat compartment)

BTO code	Species	Conservation status	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
BA	Bar-tailed godwit	Annex 1, SB, Amber	1 (10*)					
TY	Black guillemot	Amber	4 (2)	2 (4)		5 (2)	6 (2)	9 (2)
BH	Black-headed gull	SB, Amber	9 (10)	20 (10)	35 (10)	17 (10)	11 (10)	6 (10)
BF	Bullfinch	SB, Amber				X		
BZ	Buzzard		2 (21)	1 (12/18/19/27)	1 (12/18/19/27)	1 (11/16/19/29)	1 (14/19/21)	2 (30)
LQxBY	Cackling x barnacle goose hybrid						1 (11)	
CG	Canada goose					2 (14)	13 (11)	4 (11)
GU	Common guillemot	Amber				2 (2)		
CM	Common gull	Amber	150 (33)	28 (22)	34 (10)	34 (11)	75 (18)	26 (18/27)
CA	Cormorant		21 (2)	14 (2)	3 (2)	3 (2)	4 (2)	2 (2)
CU	Curlew	Red	35 (10)	45 (10)	25 (10)	42 (14)	33 (18)	33 (33)
DN	Dunlin	Annex 1, SB, Amber	23 (10)	14 (3)	7 (10)	85 (10)	22 (3)	
D.	Dunnock	SB, Amber	x	x	x	x	x	x
E.	Eider	Amber	4 (2)	4 (2)	2 (2)	9 (2)	13 (2/5)	80 (2)
FF	Fieldfare	Red	x		x	15 (16)	30 (19)	x
GP	Golden plover	Annex 1, SB			1 (10)			
GN	Goldeneye	Amber				1 (2)		
GB	Great black-backed gull	Amber	3 (2)	2 (2)	1 (2)	2 (2/10)	2 (2)	2 (2)
GK	Greenshank	Amber				1 (10)		

BTO code	Species	Conservation status	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
H.	Grey heron		2 (4/29)	2 (10)	2 (14)	1 (2/3/10)	1 (2/3/10)	
GL	Grey wagtail	Red	2 (27)			1 (3)		
GJ	Greylag goose	Amber	23 (4)	42 (14)	87 (14)	65 (18)	37 (11)	18 (14/15)
HG	Herring gull	SB, Red	11 (4)	14 (10)	6 (7)	13 (10)	18 (11)	7 (5/14)
HS	House sparrow	SB, Red		x	x	x	x	
K.	Kestrel	SB, Amber	1 (4)	1 (20/27)	1 (27)	1 (4/31)	1 (27)	1 (29)
KN	Knot	Amber	80 (10)				1 (3)	
L.	Lapwing	SB, Red					18 (26)	15 (18)
LB	Lesser black-backed gull	Amber					1 (11)	8 (18)
LI	Linnet	SB, Red	35 (4)	15 (9)	x			x
ET	Little egret			1 (10)	1 (10)	1 (10)	1 (2)	1 (10)
MA	Mallard	Amber	23 (2)	22 (2)	8 (2)	20 (2)	22 (2)	14 (2)
MP	Meadow pipit	Amber	x	30 (27)	x	x	x	x
M.	Mistle thrush	Red	x	x	x	x	x	x
MS	Mute swan	Amber	4 (2)	7 (2)		2 (2)	2 (2)	
OC	Oystercatcher	Amber	53 (10)	65 (3)	80 (10)	155 (3)	84 (3)	37 (3)
PE	Peregrine	Annex 1, SB		1 (1)	2 (2)			1 (10)
RM	Red-breasted merganser		17 (2)	2 (2)	4 (2)	6 (2)	3 (2)	2 (2)
RK	Redshank	Amber	14 (10)	10 (10)	7 (10)	13 (10)	5 (3)	6 (10)
RH	Red-throated diver	Annex 1, SB				2 (2)		
RE	Redwing	SB, Red	x	25 (11)	x	30 (16)	50 (19)	70 (16)

BTO code	Species	Conservation status	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
RB	Reed bunting	SB, Amber		x	x	x	x	x
RP	Ringed plover	Red				12 (10)	2 (3)	
SA	Shag	Annex 1, Red	4 (2)	17 (2)	14 (2)	23 (2)	15 (2)	9 (2)
SU	Shelduck	Amber	2 (2/10)	30 (10)	29 (10)	23 (10)	21 (2)	23 (10)
S.	Skylark	SB, Red						x
SN	Snipe	Amber		3 (4)	4 (4)	1 (4)	1 (4)	
ST	Song thrush	SB, Red	x	x	x	x	x	x
SH	Sparrowhawk			1 (4)	1 (18/19)			1 (19/32)
SG	Starling	SB, Red	60 (18)	x	x	22 (18)	50 (29)	45 (9)
SD	Stock dove	Amber						x
T.	Teal	Amber		22 (13)	17 (13)	28 (13)	24 (13)	25 (13)
TT	Turnstone	Amber		55 (2)	75 (2)	4 (3)	4 (4)	7 (2)
TW	Twite	SB, Red			14(4)			
WS	Whooper swan	Annex 1, SB, Amber	2 (2)					
WN	Wigeon	Amber	165 (2)	200 (2)	75 (2)	18 (2)	25 (2)	28 (2)

Annex I = Annex I of the Birds Directive; SB = Scottish Biodiversity List; Red / Amber = BoCC red / amber listed species

Blank cells = not recorded; x = present but no peak count recorded; * = numbers in brackets denote the habitat compartment number (Figure 2.1) where the peak monthly counts were recorded.

Table 3.4 compares the peak survey counts of 15 target species that had peak counts of over 10 individuals and were also recorded on 9 (75%) or more survey visits, with the highest five-year (2014/15 to 2018/19) mean peak counts (non-breeding) of these species (**Table E.5, Appendix E**) from six WeBS sectors within 5km of the Site (**Figure 3.2**). The previous peak single count of each species, for any location across Ayrshire, submitted to the Ayrshire Bird Club (Dick [ed] 2019), along with Scottish non-breeding population estimates (Forester et al 2007[15]), are also included in Table 3.4 as indicators of previous county and national population estimates.

The peak survey counts for 14 of the 15 species included in Table 3.4 are lower or comparable to the highest five-year mean peak WeBS counts (non-breeding) of these species within 5km. Although the peak count for greylag goose is notably high, this count is <0.1% of the estimated Scottish wintering population.

Table 3.4 Species with a peak count of >10 that were also recorded on nine (75%) or more survey visits

Species	Peak survey count	Highest mean peak WeBS count within 5km	Peak count as % of highest mean peak WeBS count within 5km	Ayrshire peak count: non-breeding (2016)	Scottish population estimate - non-breeding (2007)
Black-headed gull	35	220	16	500	155,500
Common gull	150	640	23	570	79,700
Cormorant	21	37	95	50	9,000-11,500
Curlew	45	421	11	150	85,700
Eider	80	280	55	250	64,500
Greylag goose	87	32	272	670	85,000+
Herring gull	18	35	72	800	91,000
Mallard	23	196	22	123	65,000-90,000
Oystercatcher	155	519	30	178	80,000-120,000
Red-breasted merganser	17	41	41	40	8,500
Redshank	14	108	22	197	4,000-25,000
Shag	23	54	43	59	60,000-80,000
Shelduck	30	124	24	30	7,000
Teal	28	108	26	300	37,500
Wigeon	200	398	50	700	76,000-96,000

[15] Forrester, R.W. & Andrews, I.J. 2007. The Birds of Scotland. Scottish O30rnithologist Club, Aberlady.

Disturbance monitoring

Background disturbance

The results of disturbance monitoring are summarised in **Table 3.5**. In the event two potential disturbance stimuli were noted, the bird data relate to the first stimulus that was recorded.

Table 3.5 Disturbance monitoring results

Disturbance stimulus	Number of events (Levels 1-5)	Number of bird responses (Level 2-5)	Average number of responses (Level 2-5)
Unknown	17	421	24.76
Predator (e.g. fox, peregrine, merlin etc).	15	312	20.80
Sailing boat or other small craft	12	200	16.66
Walkers with un-controlled dogs off lead	6	192	32.00
Tidal disturbance: natural response to rising tide	4	95	23.75
Other	1	80	80.00
Bait diggers	13	49	4.08
Vehicle	12	29	2.41
Speed boat	5	1	0.20
Walkers with controlled dogs – on/off lead	6	0	0.00
Construction noise	2	0	0.00
Total	**93**	**1,379**	

With the exclusion of 'unknown' stimuli, the most frequent disturbance events were associated with:

- Predators (20%);
- Bait diggers (17%); and
- Sailing boat or other small craft, and vehicles (16%).

The largest numbers of birds (with the exclusion of 'unknown' stimuli) were disturbed by:

- Predators (33%);
- Sailing boats and other small craft (21%); and
- Walkers with un-controlled dogs (20%).

A single 'other' disturbance event was caused by a low flying heron across the intertidal zone.

On average the largest numbers of birds responding to a single disturbance event (with the exclusion of 'unknown' and 'other' reasons) were disturbed by:

- Walkers with un-controlled dogs (32);
- Tidal activity (23.75); and

- Predators (20.80).

Disturbance responses

Level 4 and 5 responses are considered to equate most closely to significant disturbance (**Table 3.6**). A total of 7 Level 4 disturbance events and 35 Level 5 events comprised 45.16% of all recorded disturbance events.

Table 3.6 Level 4 and 5 disturbance events.

Visit Date	Level 4 Events		Level 5 Events	
	Total number of events recorded	Total number of individual responses	Total number of events recorded	Total number of individual responses
October 2019	3	46	14	195
November 2019	1	40	3	103
December 2019	1	4	11	218
January 2020	2	13	-	-
February 2020	-	-	2	44
March 2020	-	-	5	89

A total of 13 species exhibited a Level 4 or 5 response (black-headed gull, curlew, dunlin, greylag goose, heron, knot, mallard, oystercatcher, redshank, red-breasted merganser, shelduck, teal and wigeon) as summarised in **Table 3.7**.

Table 3.7 Level 4 and 5 disturbance responses

Species	Total number of individual responses (at all levels) caused by all stimuli	Number of birds showing level 4 responses	Number of birds showing level 5 responses	Most common disturbance stimuli (excluding unknown)
Black-headed gull	7	5	-	Bait diggers
Curlew	71	10	45	Predators, uncontrolled dogs and tidal influence
Dunlin	30		30	Bait diggers and small vessels
Greylag goose	105	7	-	Bait diggers, un-controlled dogs and dog walkers with controlled dogs
Heron	1	1	-	Bait diggers
Knot	240	-	80	Unknown and low flying heron
Mallard	6	-	6	Predators
Oystercatcher	314	-	312	Predators and tidal influence

Species	Total number of individual responses (at all levels) caused by all stimuli	Number of birds showing level 4 responses	Number of birds showing level 5 responses	Most common disturbance stimuli (excluding unknown)
Redshank	16	-	16	Predators and bait diggers
Red-breasted merganser	1	-	1	Unknown
Shelduck	33	-	8	Predator and bait diggers
Teal	8	-	8	Unknown
Wigeon	451	80	143	Small sailing and other vessels, predator

4. Conclusions

4.1 Current Baseline

Breeding Birds

The breeding bird community within the Study Area primarily comprises low numbers of common and widespread species (Dick [ed] 2019, Simpson [ed] 2017) that are typical of the county (Ayrshire) and the habitats present (scrub, trees, hedgerows and manmade structures).

Breeding lesser black-backed gulls are a qualifying feature of both Ailsa Craig SPA and Rathlin Island SPA. Although the Study Area is within the potential foraging range of these SPA populations it is not designated as part of either of the SPAs, therefore the birds breeding within the Study Area are not functionally linked to SPA populations. Similarly, breeding herring gulls are a qualifying feature of Rathlin Island SPA and the Study Area is within the potential foraging range of this SPA population, however the herring gulls breeding within the Study Area are not functionally linked to the SPA population for the same reason.

No species listed on Schedules 1, 1A or A1 of the Wildlife and Countryside Act 1981 (as amended in Scotland) were recorded breeding within the Study Area. The desk study did not identify any records of hen harrier (qualifying feature of Renfrewshire Heights SPA and Arran Moors SPA) within 3 km of the Site and this species, which in the British Isles nests and roosts on open/upland moors, was not recorded during the surveys, recognising that the habitats within the Study Area are unlikely to attract this species.

Breeding (or potentially breeding) pairs/territories of six species, which are either listed on the Scottish Biodiversity List or BoCC Red List (Eaton *et al*., 2015), were recorded within the Study Area: dunnock (3), herring gull (12), house sparrow (7), linnet (2), reed bunting (1) and song thrush (1). Herring gull nest on the roofs of the power station buildings, house sparrow also breed in the built areas and the remaining species are associated with scrub and woodland habitats, mainly outside of the HNB security fence. These breeding pairs are likely to represent less than 1% of the respective Ayrshire populations.

Non-breeding Birds

Distribution and abundance

The non-breeding bird assemblages within the Study Area primarily comprise a range of species associated with coastal habitats and over-wintering farmland birds. A total of 55 target species were recorded:

- Seven of these species are listed on Annex I of the Birds Directive (bar-tailed godwit, dunlin, golden plover, peregrine, red-throated diver, shag and whooper swan);
- Twenty species are on the Scottish Biodiversity List (bar-tailed godwit, black-headed gull, bullfinch, dunlin, dunnock, golden plover, herring gull, house sparrow, kestrel, lapwing, linnet, peregrine, red-throated diver, redwing, reed bunting, skylark, song thrush, starling, twite and whooper swan);
- Fifteen species are listed on the Birds of Conservation Concern (BoCC) red-list (curlew, fieldfare, grey wagtail, herring gull, house sparrow, lapwing, linnet, mistle thrush, redwing, ringed plover, shag, skylark, song thrush, starling and twite); and
- Twenty-nine species are on the BoCC Amber-list (black guillemot, black-headed gull, bullfinch, common guillemot, common gull, dunlin, dunnock, eider, goldeneye, great black-backed gull, greenshank, greylag goose, kestrel, knot, lesser black-backed gull, mallard, meadow pipit, mute

swan, oystercatcher, redshank, reed bunting, shelduck, snipe, stock dove, teal, turnstone, whooper swan and wigeon).

The temporal and spatial distribution of peak counts of non-breeding birds is summarised in **Table 3.3**, with the most notable areas in terms of bird species and numbers being associated with intertidal and near-shore habitats (habitat compartments 2, 3 and 10, **Figure 2.1**). These areas are primarily used by birds that are feeding and foraging, loafing and roosting.

The peak counts of 14 of the 15 target species that had peak counts of over 10 individuals and were also recorded on 9 (75%) or more survey visits, are lower or comparable to the highest five-year mean peak WeBS counts (non-breeding) within 5km of the Site. Although the peak survey count for greylag goose is notably high compared to the five-year mean peak WeBS counts within 5km, this count is <0.1% of the estimated Scottish non-breeding population (Forester *et al*, 2007).

All other species were not recorded regularly enough, or in sufficient numbers, within the Study Area to be considered populations/assemblages of notable nature conservation importance.

Disturbance

The most common disturbance stimuli recorded within the intertidal habitats within the Survey Area were predators, bait digging, vehicles and sailing vessels and other small craft. The greatest disturbance responses by birds were associated with the presence of predators, sailing vessels and other small craft and walkers with uncontrolled dogs.

The five wildfowl species in **Table 3.7** (greylag goose, mallard, shelduck, teal and wigeon) were most commonly disturbed by sailing vessels and other small craft, predators, bait diggers and dogs.

Of the five wader species in **Table 3.7** (curlew, dunlin, knot, oystercatcher and redshank), the three most common disturbance stimuli were predators, tidal activity and bait diggers. Knot also responded to low flying heron.

Appendix A Figures

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217000 218000 219000 220000 221000

653000 652000 651000 650000

N

Jetty
Hunterston Construction Yard
Black Rock
Ore Terminal
Southannan Mains
A78
FB
Allan Wood
53
27
Hunterston Ore Terminal
Glenside
Castle Hill Homestead
The Glen
Hunterston Sands
Brigurd Point
Poteath
Poteathbank Cottage
Reservoir
Gull's Walk
Jetty
Inner Brigurd Point
Shore Cottage
52
Biglies Farm
Biglees Hill
Coastal Path
Hillhouse
Stoney Port
Landing Stage
Hunterston House
Kilruskin Wood
Hunterston Castle
Burn Gill
Little Brigurd
HUNTERSTON 'A'
Hunterston Nuclear Generating Station
Goldenberry
Resr
Campbelton
Campbelton Hill
Kilruskin Bridge
North Kilruskin
51
Dam
Castle Knowe
South Kilruskin
Pier
Hawking Craig
Blue Stones
17
18
19
20
21
Goldenberry Hill
140
Millstonford Bridge
Highthorn Bridge
The Three Sisters
Ardneil Hill
Thirdpart
Millstonford
50
Bushglen Bridge
Bushglen
B782
Waterside Hill
Jenny's Dyke
Northbank
Thirdpart Holdings
Carlung Farm
Thicket Plantation
Cat

Key

Hunterston B Nuclear Site Licence boundary

Double security fence

0 250 500 750 m

Scale at A3: 1:15,000

Hunterston B Decommissioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 1.1
Site location

September 2020

wood.

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217500 218000 218500 219000

652000 651500 651000

N

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Breeding bird survey area
- Non-breeding bird survey area
- Observation point (non-breeding bird survey)

Habitat compartments (non-breeding bird survey)

1, Urban / buildings (Hunterston B)
2, Sea
3, Rocky beach
4, Unimproved grassland / scrub
5, Urban / buildings
6, Urban / buildings
7, Amenity grassland
8, Urban / buildings
9, Unimproved grassland / scrub
10, Mudflats (tidal)
11, Improved grassland / pasture (sheep)
12, Unimproved grassland
13, Pond
14, Improved grassland / pasture (sheep)
15, Improved grassland / pasture
16, Deciduous woodland
17, Improved grassland / pasture
18, Improved grassland/pasture (sheep & cattle)
19, Deciduous woodland
20, Improved grassland / pasture
21, Deciduous woodland
22, Improved grassland / pasture
23, Improved grassland / pasture (sheep)
24, Semi-improved grassland
25, Unimproved grassland / scrub (cattle)
26, Semi-improved grassland
27, Semi-improved grassland
28, Deciduous woodland
29, Improved grassland / pasture
30, Deciduous woodland
31, Semi-improved grassland
32, Semi-improved grassland
33, Improved grassland / pasture
34, Deciduous woodland

0 100 200 300 m

Scale at A3: 1:6,500

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 2.1
Study area

September 2020

wood.

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Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 3.1
Statutory biodiversity sites (ornithological importance)

September 2020

wood.

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215000

220000

655000

650000

N

72455

72453

72450

72456

72457

72452

72434

72082

72432

72431

72146

B896

B899

A78

B7048

B781

B782

B7047

Great Cumbrae Island

Gourd Hill

Play Hill

Minister's Hill

Millport

Aird Hill

Craigengour Hill

Auchenhary Hill

Fairlie

Craig Hill

Ward Hill

Fairlie Glen

Lairdside Hill

Diamond Hill

Southannan Sands

Kaim Hill

Black Hill

Hill of Hills

Lighthouse Hill

Bigeedmore

Green Hill

Glentane Hill

Caldron Hill

Crosbie Hills

Greenside Hill

Campbelton Hill

Ardneil Hill

Waterside Hill

Glenton Hill

Auld Hill

Croek Hill

Drummilling Hill

West Kilbride

Meadowfoot

Law Hill

Blackshaw Hill

North Hill or Knockewart

Haupland Muir

South Hill

Aiknut Hill

Tarbert Hill

Seamill

Hinglie Hill

Kirkland Glen

Key

Hunterston B Nuclear Site Licence boundary

Double security fence

5km search area around the Site

WeBS (Wetland Bird Survey) Sectors

0 500 1,000 1,500 2,000 m

Scale at A3: 1:40,000

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 3.2
WeBS (Wetland Bird Survey) Sectors within 5km

September 2020

wood.

218000

218500

651500

651000

N

RB
MP
SW
2 x Li
B
R
PW
BT
GO
JD
WW
MG
ST
D
CT
CD
WR
2 x HS
C
3 x HS
WP
3 x JD
CH
WH
HM

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Study Area
- B Blackbird
- BT Blue tit
- C Carrion crow
- CH Chaffinch
- CT Coal tit
- CD Collared dove
- D Dunnock
- GO Goldfinch
- GT Great tit
- HM House martin
- HS House sparrow
- JD Jackdaw
- LI Linnet
- MG Magpie
- MP Meadow pipit
- PW Pied Wagtail
- RB Reed bunting
- R Robin
- SW Sedge warbler
- ST Song thrush
- WH Whitethroat
- WW Willow warbler
- WP Woodpigeon
- WR Wren

0 50 100 150 200 m

Scale at A3: 1:4,000

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 3.3a
Breeding bird territories (terrestrial species)

September 2020

wood.

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218000

218500

651500

651000

N

OC

HG

LB

Key

Hunterston B Nuclear Site Licence boundary

Double security fence

Study Area

HG Herring gull

LB Lesser black-backed gull

OC Oystercatcher

0 50 100 150 200 m

Scale at A3: 1:4,000

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 3.3b
Breeding bird territories (seabird species)

September 2020

wood.

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Appendix B Species names and BTO codes

BTO species code	Species (Common) name	Species (Scientific name)
AE	Arctic term	*Sterna paradisaea*
BO	Barn owl	*Tyto alba*
BA	Bar-tailed godwit	*Limosa lapponica*
BE	Bean goose	*Answer fabalis*
TY	Black guillemot	*Cepphus grylle*
B.	Blackbird	*Turdus merula*
BC	Blackcap	*Sylvia atricapilla*
BH	Black-headed gull	*Chroicocephalus ridibundus*
BW	Black-tailed godwit	*Limosa limosa*
BV	Black-throated diver	*Gavia arctica*
BT	Blue tit	*Cyanistes caeruleus*
BF	Bullfinch	*Pyrrhula pyrrhula*
BZ	Buzzard	*Buteo buteo*
LQ x BY	Cackling x barnacle goose hybrid	*Branta hutchinsii x leucopsis*
CG	Canada goose	*Branta canadensis*
C.	Carrion crow	*Corvus corone*
CH	Chaffinch	*Fringilla coelebs*
CC	Chiffchaff	*Phylloscopus collybita*
CT	Coal tit	*Periparus ater*
CD	Collared dove	*Streptopelia decaocto*
CR	Common crossbill	*Loxia curvirostra*
GU	Common guillemot	*Uria aalge*
CM	Common gull	*Larus canus*
CS	Common sandpiper	*Actitis hypoleucos*
CN	Common tern	*Sterna hirundo*
CA	Cormorant	*Phalacrocorax carbo*
CO	Coot	*Fullica atra*
CU	Curlew	*Numenius arquata*

BTO species code	Species (Common) name	Species (Scientific name)
DN	Dunlin	*Calidris alpina*
E.	Eider	*Somateria mollissima*
FP	Feral pigeon	*Columba livia (domest.)*
FF	Fieldfare	*Turdus pilaris*
F.	Fulmar	*Fulmarus glacialis*
GA	Gadwall	*Anas strepera*
GC	Goldcrest	*Regulus*
GP	Golden plover	*Pluvialis apricaria*
GN	Goldeneye	*Bucephala clangula*
GO	Goldfinch	*Carduelis carduelis*
GD	Goosander	*Mergus merganser*
GH	Grasshopper warbler	*Locustella naevia*
GB	Great black-backed gull	*Larus marinus*
GS	Great spotted woodpecker	*Dendrocopos major*
GT	Great tit	*Parus major*
GR	Greenfinch	*Chloris*
GK	Greenshank	*Tringa nebularia*
H.	Grey heron	*Ardea cinerea*
P.	Grey partridge	*Perdix perdix*
GL	Grey wagtail	*Motacilla cinerea*
GJ	Greylag goose	*Anser anser*
HH	Hen harrier	*Circus cyaneus*
HG	Herring gull	*Larus argentatus*
HC	Hooded crow	*Corvus cornix*
HM	House martin	*Delichon urbicum*
HS	House sparrow	*Passer domesticus*
JD	Jackdaw	*Coloeus monedula*
JS	Jack snipe	*Lymnocryptes minimus*
J.	Jay	*Garrulus glandarius*
K.	Kestrel	*Falco tinnunculus*

BTO species code	Species (Common) name	Species (Scientific name)
KF	Kingfisher	*Alcedo atthis*
KI	Kittiwake	*Rissa tridactyla*
KN	Knot	*Calidris canutus*
L.	Lapwing	*Vanellus vanellus*
LB	Lesser black-backed gull	*Larus fuscus*
LR	Lesser redpoll	*Acanthis cabaret*
LI	Linnet	*Linaria cannabina*
ET	Little egret	*Egretta garzetta*
LT	Long-tailed tit	*Aegithalos caudatus*
MG	Magpie	*Pica*
MA	Mallard	*Anas platyrhynchos*
MP	Meadow pipit	*Anthus pratensis*
ML	Merlin	*Falco columbarius*
M.	Mistle thrush	*Turdus viscivorus*
MS	Mute swan	*Cygnus olor*
OC	Oystercatcher	*Haematopus ostralegus*
PE	Peregrine	*Falco peregrinus*
PH	Pheasant	*Phasianus colchicus*
PF	Pied flycatcher	*Ficedula hypoleuca*
PT	Pintail	*Anas acuta*
PW	Pied wagtail	*Motacilla alba*
PO	Pochard	*Aythya ferina*
PU	Puffin	*Fratercula arctica*
PS	Purple sandpiper	*Calidris maritima*
RN	Raven	*Corvus corax*
RM	Red-breasted merganser	*Mergus serrator*
RK	Redshank	*Tringa totanus*
RH	Red-throated diver	*Gavia stellata*
RE	Redwing	*Turdus iliacus*
RB	Reed bunting	*Emberiza schoeniclus*

BTO species code	Species (Common) name	Species (Scientific name)
RP	Ringed plover	*Charadrius hiaticula*
R.	Robin	*Erithacus rubecula*
RC	Rock pipit	*Anthus petrosus*
RO	Rook	*Corvus frugilegus*
TE	Sandwich tern	*Thalasseus sandvicensis*
SP	Scaup	*Aythya marila*
SW	Sedge warbler	*Acrocephalus schoenobaenus*
SA	Shag	*Phalacrocorax aristotelis*
SU	Shelduck	*Tadorna*
SV	Shoveler	*Anas clypeata*
SK	Siskin	*Spinus spinus*
S.	Skylark	*Alauda arvensis*
SN	Snipe	*Gallinago gallinago*
ST	Song thrush	*Turdus philomelos*
SH	Sparrowhawk	*Accipter nisus*
SF	Spotted flycatcher	*Muscicapa striata*
SG	Starling	*Sturnus vulgaris*
SD	Stock dove	*Columba oenas*
SC	Stonechat	*Saxicola rubicola*
SL	Swallow	*Hirundo rustica*
SI	Swift	*Apus*
T.	Teal	*Anas crecca*
TC	Treecreeper	*Certhia familiaris*
TT	Turnstone	*Arenaria interpres*
TW	Twite	*Linaria flavirostris*
WI	Water pipit	*Anthus spinoletta*
W.	Wheatear	*Oenanthe*
WM	Whimbrel	*Numenius phaeopus*
WC	Whinchat	*Saxicola rubetra*
WH	Whitethroat	*Sylvia communis*

BTO species code	Species (Common) name	Species (Scientific name)
WS	Whooper swan	*Cygnus cygnus*
WG	Wigeon	*Anas penelope*
WW	Willow warbler	*Phylloscopus trochilus*
WO	Wood warbler	*Phylloscopus sibilatrix*
WK	Woodcock	*Scolopax rusticola*
WP	Woodpigeon	*Columba palumbus*
WR	Wren	*Troglodytes*
YW	Yellow wagtail	*Motacilla flava*
Y.	Yellowhammer	*Emberiza citrinella*

Appendix C Relevant legislation and policy

Wildlife and Countryside Act 1981 (as amended in Scotland)

For any wild bird species, it is an offence to intentionally or recklessly:

- Kill, injure or take a bird;
- Take, damage, destroy or interfere with a nest of any bird while it is in use or being built;
- Obstruct or prevent any bird from using its nest; and
- Take or destroy an egg of any bird.

For any wild bird species listed on Schedule 1, it's an offence to disturb:

- Any bird while it is building a nest;
- Any bird while is in, on, or near a nest containing eggs or young;
- Any bird while lekking; and
- The dependent young of any bird.

For any wild bird species listed on Schedule 1A, it's an offence to intentionally or recklessly harass any bird.

For any wild bird species listed on Schedule A1, it's an offence to intentionally or recklessly take, damage, destroy or interfere at any time with a nest habitually used by any bird.

Biodiversity Policy

The UK Biodiversity Action Plan (UK BAP), produced in 1994 by the UK Government, was a national strategy for the conservation of biodiversity. The plan was updated in July 2012 to comprise a framework, which is implemented individually by each of the four UK countries and covers the period 2011-2020. Within Scotland, the UK BAP is coordinated through the Biodiversity Action Reporting System (BARS), which is an online tool that contains a list of Scottish priority habitats and species (The Scottish Biodiversity List [SBL]).

The SBL is a list of flora, fauna and habitats considered by the Scottish Ministers to be of principal importance for biodiversity conservation and its publication was a requirement of Section 2(4) of The *Nature Conservation (Scotland) Act 2004*.

https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list

Directive 2009/147/EC (The Wild Birds Directive), 2009

Certain bird species receive protection at a European level as listed on Annex I of the Directive 2009/147/EC of The European Parliament and of The Council of 30 November 2009 on the conservation of wild birds (codified version).

The *Wild Birds Directive* recognises that habitat loss and degradation are the most serious threats to the conservation of wild birds. It therefore places great emphasis on the protection of habitats for endangered as well as migratory species (listed in Annex I), especially through the establishment of a coherent network of Special Protection Areas (SPAs) comprising all the most suitable territories for these species. Together with Special Areas of Conservation (SACs) designated under *Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('Habitats Directive')*, SPAs form a network of pan-European protected areas known as Natura 2000.

Ramsar Sites

Ramsar sites are wetlands of international importance designated under the Ramsar Convention. Sites proposed for selection are advised by the UK statutory nature conservation agencies, or the relevant administration in the case of Overseas Territories and Crown Dependencies, co-ordinated through JNCC. In selecting sites, the relevant authorities are guided by the Criteria set out in the Convention. The Criteria pertaining specifically to birds are as follows:

- Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds; and
- Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

In the UK, the first Ramsar sites were designated in 1976 since which, many more have been designated. The initial emphasis was on selecting sites of importance to waterbirds within the UK, and consequently many Ramsar sites are also Special Protection Areas (SPAs) classified under the Birds Directive. However, greater attention is now being directed towards non-bird features which are increasingly being taken into account, both in the selection of new sites and when reviewing existing sites.

Birds of Conservation Concern: Red and Amber Lists

Red and Amber list bird are those listed as being of high or medium conservation concern (respectively) in Birds of Conservation Concern (BoCC) 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man (Eaton *et al.*, 2015). Red list species are those that are Globally Threatened according to IUCN criteria; and/or those whose population or range has declined rapidly in recent years; and/or those that have declined historically and not shown a substantial recent recovery.

Appendix D Habitat/crop type codes

Table D.1 Habitat/crop type codes

Code	Habitat/ crop type
BA	Spring barley
BE	**Beach (shingle/ shell / sandy beaches)**
BN	Beans (winter beans, peas, broad beans etc)
BR	Brassicas Other (cabbage, brocoli, kale etc – not oilseed rape)
CA	Carrots / parsnips
CW	Coniferous woodland
DI	Ditch (water-filled)
DR	Ditch Reed (water-filled, and lined/ filled with reeds)
DW	**Deciduous woodland**
FA	Fallow / uncultivated / seta-side
GA	Gardens (residential gardens / housing)
GM	Grazing marsh
HR	**Hedgerows**
HS	Hard standing / bare ground
LE	Legumes Other (Alfalfa/ Lucerne, clover etc)
IG	**Improved grassland / pasture (record livestock if present)**
LA	Lakes (still waterbody: lake, gravel pit, reservoir etc)
MA	Maize
MF	**Mudflats (tidal)**
MS	Maize stubble
MW	**Mixed deciduous/coniferous woodland**
PL	Ploughed land / bare (soil) ground
PO	Pond
RA	Oilseed rape
RB	Reedbed / reed swamp
RO	**Rocky beach**
RI	River / streams

Code	Habitat/ crop type
RS	Rape stubble
SB	Sugar beet
SC	**Scrub**
SI	**Semi-improved grassland**
SM	Saltmarsh
SR	Cereal stubble / rape mix (early in autumn)
ST	Cereal stubble
SW	Sea-wall
UG	**Unimproved grassland**
UR	Urban / buildings
UT	Utility grassland (playing field / park)
WC	Winter-sown cereal (wheat or barley)

Appendix E Desk study data

Table E.1 Breeding bird surveys (EDF 2011-17)

Species name	2017	2015	2011
Blackbird	18	14	6
Blackcap	1	2	3
Blue tit	10	13	3
Buzzard	1	1	1
Carrion crow	3	3	5
Chaffinch	14	15	8
Chiffchaff	0	0	3
Coal tit	5	2	3
Common gull	0	1	0
Dunnock	6	9	0
Eider	0	0	0
Goldcrest	3	1	0
Goldfinch	8	7	2
Grasshopper warbler	0	0	1
Great spotted woodpecker	0	1	0
Great tit	7	7	4
Greenfinch	0	1	0
House martin	0	0	5
Jackdaw	2	1+	8
Linnet	2	3	2
Long tailed tit	2	0	0
Magpie	2	2	1
Mallard	2	1	10
Meadow pipit	7	4	0
Mistle thrush	2	2	3
Mute swan	0	0	1
Oystercatcher	4	3	0

Species name	2017	2015	2011
Pied flycatcher	0	0	1
Pied wagtail	7	4	0
Reed bunting	4	3	0
Robin	13	13	4
Sedge warbler	8	6	4
Song thrush	5	3	0
Spotted flycatcher	1	1	0
Starling	3	3	5
Stonechat	1	1	0
Swallow	3	0	5
Treecreeper	0	1	0
Whitethroat	3	4	5
Willow warbler	13	9	3
Wood pigeon	3	4	0
Wren	19	20	4

NB: the figures shown are the maximum number of breeding territories/ pairs within the survey area, including confirmed, probable and possible breeding territories/ pairs.

Table E.2 Non-breeding bird surveys (EDF 2018-19): peak species counts by month

Species / Month / Peak counts	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019
Greylag goose	0	36	0	4	0	34
Teal	1	16	5	0	9	10
Shelduck	n/c	26	30	48	63	23
Mallard	0	54	15	27	73	13
Pintail	0	0	0	0	1	0
Eider	n/c	0	0	14	6	4
Goldeneye	0	0	0	0	1	0
Red-breasted merganser	4	9	5	3	1	0
Red-throated diver	n/c	0	0	1	0	0
Cormorant	2	0	5	0	5	2
Shag	11	0	23	28	7	4

Species / Month / Peak counts	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019
Grey heron	1	2	1	1	1	0
Little egret	0	3	0	0	0	0
Sparrowhawk	0	0	1	0	1	0
Buzzard	3	4	2	3	4	3
Kestrel	0	0	0	0	0	1
Peregrine	0	1	0	0	0	0
Pheasant	n/c	n/c	n/c	n/c	n/c	n/c
Oystercatcher	n/c	114	62	83	128	89
Ringed Plover	n/c	27	43	22	0	1
Lapwing	n/c	0	0	1	1	0
Dunlin	n/c	22	14	1	0	0
Common snipe	11	4	7	4	7	7
Jack snipe	1	0	0	1	1	0
Woodcock	0	0	1	1	1	1
Curlew	72	166	9	51	79	32
Redshank	n/c	33	16	20	6	2
Greenshank	0	1	0	0	0	0
Turnstone	n/c	0	0	15	0	22
Black-headed gull	n/c	60	17	26	80	8
Common gull	n/c	154	153	665	469	95
Lesser black-backed gull	n/c	0	0	0	1	11
Herring gull	19	10	27	5	17	53
Greater black-backed gull	1	1	6	4	3	3
Black guillemot	7	0	0	0	0	0
Woodpigeon	0	5	5	27	20	33
Feral pigeon	n/c	n/c	n/c	n/c	n/c	n/c
Great spotted woodpecker	4	4	11	9	8	14
Magpie	4	4	11	9	8	14
Jackdaw	230	37	169	24	250	115

Species / Month / Peak counts	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019
Rook	25	10	0	0	6	2
Carrion crow	n/c	7	52	33	35	16
Raven	1	1	2	2	0	0
Goldcrest	2	5	3	2	6	8
Blue tit	11	5	89	8	31	28
Great tit	7	1	5	3	7	8
Coal tit	9	3	4	4	1	4
Long-tailed tit	5	0	2	0	3	6
Treecreeper	0	1	0	2	1	3
Wren	15	23	31	12	15	16
Starling	107	0	20	120	39	0
Blackbird	5	23	27	20	16	12
Fieldfare	85	2	5	22	0	0
Song thrush	7	12	25	12	7	8
Redwing	1	34	27	181	69	0
Mistle thrush	5	3	11	0	3	5
Robin	20	19	27	22	14	22
Stonechat	0	1	0	0	0	0
Dunnock	8	17	31	14	11	13
Pied wagtail	19	9	4	2	5	7
Grey wagtail	2	2	1	1	0	2
Meadow pipit	19	9	4	13	5	7
Water pipit	0	1	0	0	0	0
Rock pipit	5	40	12	11	14	15
House sparrow	0	0	4	3	1	4
Chaffinch	5	12	322	355	63	21
Brambling	0	0	0	1	0	0
Greenfinch	0	19	51	19	29	7
Goldfinch	9	5	2	2	2	1

Species / Month / Peak counts	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019
Linnet	0	0	25	0	0	1
Lesser redpoll	0	0	0	1	0	0
Siskin	1	43	1	18	3	3
Bullfinch	0	3	0	0	0	0
Reed bunting	0	2	3	2	1	5

n/c – not counted

Table E.3 JNCC Seabird Monitoring Programme: breeding seabird colonies within 10 km of the Site

Seabird colony site	Distance (direction) from the Site	Species	1998-2002	2014	2016	2017	2019
Hunterston Cliffs	180 m (S)	Fulmar	33				
Hunterston (Tysties) 2	600 m (SW)	Black guillemot	10				
Hunterston (Tysties) 3	2.0 km (SSW)	Black guillemot	0				
Hunterston (Tysties) 1	2.3 km (NNE)	Black guillemot	10				
Little Cumbrae Island	2.6 km (W)	Black guillemot	6				
Little Cumbrae Island	2.6 km (W)	Common gull	16				
Little Cumbrae Island	2.6 km (W)	Fulmar	12				
Keppel	2.6 km (NNW)	Fulmar	16				11
Little Cumbrae Island	2.6 km (W)	Great black-backed gull	120				
Little Cumbrae Island	2.6 km (W)	Herring gull	2,000				
Little Cumbrae Island	2.6 km (W)	Lesser black-backed gull	1,200				
Little Cumbrae Island	2.6 km (W)	Shag	20				
Hunterston, Clydeport	3.1 km (NE)	Black-headed gull	50				
Hunterston, Clydeport	3.1 km (NE)	Common gull	4				
Hunterston, Clydeport	3.1 km (NE)	Common tern	12				
Hunterston, Clydeport	3.1 km (NE)	Great black-backed gull	1				
Doughend Hole	4.5 km (NW)	Fulmar	10				11
Barbay Hill	5.3 km (NNW)	Common gull	144				11
Kerrysonlia Point	7.9 km (NW)	Fulmar	3				

Seabird colony site	Distance (direction) from the Site	Species	1998-2002	2014	2016	2017	2019
Horse Island	8.7 km (SSE)	Cormorant	51	0	2	0	
Horse Island	8.7 km (SSE)	Great black-backed gull	0	20	6	2	
Horse Island	8.7 km (SSE)	Herring gull	0	1,693	1,113	1,245	
Horse Island	8.7 km (SSE)	Lesser black-backed gull	0	1,093	910	901	
Horse Island	8.7 km (SSE)	Shag	0	1	3	0	
Largizean Farm	9.7 km (WNW)	Fulmar	4				0
Ardrossan Harbour	10 km (SSE)	Black guillemot	20				
Ardrossan Harbour	10 km (SSE)	Lesser black-backed gull	2,677				
Dunstrone	10.5 km (WNW)	Fulmar	2				

Zero ('0') denotes that a count was undertaken but no birds were located in that year; blank denotes that no count was undertaken.

Table E.4 Summary (number of records) of SWSEIC bird data

		Breeding season[16]		Non-breeding season	
Species name	**Conservation status[17]**	**Potentially within 1km of Site[18]**	**Potentially within Site**	**Potentially within 1km of Site**	**Potentially within Site**
Arctic Tern	Annex I, SB	(1)			
Barn Owl	WCA(Sch1), SB			2	
Barnacle goose	Annex I, SB			1	
Bar-tailed godwit	Annex I, SB	(4)	(2)	4	2
Black-headed gull	SB	5	2	7	3
Black-throated diver	WCA(Sch1), Annex I, SB			1	
Bullfinch	SB	2	1	2	
Common crossbill	WCA(Sch1)				2
Common tern	Annex I, SB	(3)	(1)		
Curlew	SB, BoCC (red)	3	2	9	4
Dunlin	Annex I, SB	(4)	(1)	3	

[16] Figures in parenthesis relate to species recorded during the breeding season that are unlikely to breed in the local area, and thus, likely relate to passage birds and/or foraging seabirds from nesting colonies in the area.

[17] WCA(Sch1) = listed on schedules 1, 1A or A1 of the Wildlife & Countryside Act 1981 (as amended in Scotland); Annex I = Annex I of the Birds Directive; SB = Scottish Biodiversity List; BoCC (red) = BoCC red list in Eaton *et al*., 2015).

[18] Potentially within 1km of the Site but outwith the Site boundary

Species name	Conservation status[17]	Breeding season[16]		Non-breeding season	
		Potentially within 1km of Site[18]	Potentially within Site	Potentially within 1km of Site	Potentially within Site
Dunnock	SB	3	1	2	1
Golden plover	Annex I, SB			2	1
Goldeneye	WCA(Sch1)			2	
Grasshopper warbler	SB, BoCC (red)	5	3		
Greenshank	WCA(Sch1)			2	1
Grey Partridge	SB, BoCC (red)	1			
Grey Wagtail	BoCC (red)	1		1	1
Yellow wagtail	SB, BoCC (red)		(1)		
Herring gull	SB, BoCC (red)	7	2	7	4
Hooded crow	SB	4	1	3	2
House sparrow	SB, BoCC (red)	2	1	1	
Kestrel	SB		3	1	2
Kingfisher	WCA(Sch1), Annex I, SB			1	1
Kittiwake	BoCC (red)	(1)		1	1
Lapwing	SB, BoCC (red)	5	1	2	1
Lesser redpoll	SB, BoCC (red)	2	2	1	1
Linnet	SB, BoCC (red)	5			
Merlin	WCA(Sch1), Annex I, SB, BoCC (red)				1
Mistle thrush	BoCC (red)	5	2	2	1
Pied flycatcher	BoCC (red)	1			
Puffin	BoCC (red)	(1)			
Red-throated diver	WCA(Sch1), Annex I, SB			2	1
Reed bunting	SB	6	3	2	2
Ringed plover	BoCC (red)	7	1	2	
Sandwich tern	Annex I, SB	(3)	(2)		
Shag	BoCC (red)	5		5	1
Siskin	SB	2	1		1

Species name	Conservation status[17]	Breeding season[16]		Non-breeding season	
		Potentially within 1km of Site[18]	Potentially within Site	Potentially within 1km of Site	Potentially within Site
Skylark	SB, BoCC (red)			2	1
Song thrush	SB, BoCC (red)	3	3	4	3
Spotted flycatcher	SB, BoCC (red)	4	3		1
Starling	SB, BoCC (red)	7	2	4	3
Swift	SB	2	1		
Twite	SB, BoCC (red)	2	2	2	
Whinchat	BoCC (red)		1		
Wood warbler	SB, BoCC (red)	3	1		
Woodcock	SB, BoCC (red)			2	1
Yellowhammer	SB, BoCC (red)			1	

Table E.5 BTO WeBS data: 5-year mean peak counts by count sector (**Figure 3.2**) within 5km

Species ↓ / Sector *→	72432 Hunterston Sands [1]	72431 Ardrossan – West Kilbride [2]	72082 Hunterston Lagoon [3]	72434 Hunterston – Fairlie [4]	72452-57, Great Cumbrae Island [5]	72450-51 Wemyss Bay – Fairlie [6]
Canada Goose	1				2	
Greylag Goose	32				5	
Greylag Goose (British/Irish)					5	
Greylag Goose (Icelandic)	32					
Taiga/Tundra Bean Goose	1					
Pink-footed Goose	9					
Mute Swan	19	3	76	12	1	7
Whooper Swan	6		8			
Shelduck	124	5	1	4		1
Shoveler	2					
Gadwall	8		2			
Wigeon	398	71	290	206	23	55
Mallard	106	58	42	21	23	35

Species ↓ / Sector *→	72432 Hunterston Sands [1]	72431 Ardrossan – West Kilbride [2]	72082 Hunterston Lagoon [3]	72434 Hunterston – Fairlie [4]	72452-57, Great Cumbrae Island [5]	72450-51 Wemyss Bay – Fairlie [6]
Pintail	2		1			
Teal	108	17		7	18	
Pochard				1		
Scaup			2			
Eider	146	92	2	46	11	280
Eider (except Shetland)	146	92	2	46	11	280
Goldeneye	11	1	13	2		9
Goosander						2
Red-breasted Merganser	41	5	12		3	30
Red-throated Diver	4	1				2
Black-throated diver	1					
Little Grebe			15	2	1	1
Grey Heron	7	4	27	4	4	4
Shag	54	29		15	11	24
Cormorant	22	37	1	4	26	36
Moorhen	3					
Coot	1					
Oystercatcher	519	246	259	109	113	244
Lapwing	53	4	102	4	33	19
Golden Plover	1	2				
Grey Plover	3	1				
Ringed Plover	45	16			3	42
Whimbrel	6					
Curlew	421	81	31	3	41	83
Bar-tailed Godwit	31	2	10	1		
Black-tailed godwit	3					
Turnstone	22	17	1		13	15
Knot	12					
Dunlin	56	30	54	4		13

Species ↓ / Sector *→	72432 Hunterston Sands [1]	72431 Ardrossan – West Kilbride [2]	72082 Hunterston Lagoon [3]	72434 Hunterston – Fairlie [4]	72452-57, Great Cumbrae Island [5]	72450-51 Wemyss Bay – Fairlie [6]
Purple Sandpiper		4				
Snipe	6	1				
Common Sandpiper	1				5	
Redshank	63	42	108	77	16	11
Greenshank	2	1	10	4		
Unidentified small wader					1	
Kittiwake	2					
Black-headed Gull	220		n/c	67	1	n/c
Common Gull	640		n/c	40	3	n/c
Great Black-backed Gull			n/c	1	1	n/c
Herring Gull	25		n/c	35	28	n/c
Lesser Black-backed Gull	1		n/c	4	3	n/c
Sandwich Tern	13	10	n/c	25		n/c
Common Tern	1		n/c	2		n/c
Common/Arctic Tern	1		n/c			n/c

* No data for Sector 72146 (Glenburn reservoir); [1] – 07/08-11/12 data; [2]- 15/16-17/18 data (3 years only); [3]– 2005/6 -2009/10 data; [4] – 2013/14 – 2017/18 data; [5] – 2016/17 – 2017/18 data (2 years only); [6] – 2008/9 – 2012/13 data; n/c – not counted

Appendix F Survey parameters

Table F.1 Breeding bird survey

Survey visit No.	Date	Start – finish	Weather conditions
1	26/04/2019	06:10 – 09:25	Precipitation (drizzle); Wind (Beaufort 2-3, SE); Cloud (8/8 Oktas); Visibility (very good > 3 km); Temperature (8-10 °C)
2	09/05/2019	05:10 – 09:00	Precipitation (none); Wind (Beaufort 1-2, NW); Cloud (1/8 Oktas); Visibility (very good > 3 km); Temperature (9-13 °C)
3	24/05/2019	05:10 – 09:00	Precipitation (none); Wind (Beaufort 1-2, SW); Cloud (2-6/8 Oktas); Visibility (very good > 3km); Temperature (8-12 °C)
4	04/06/2019	05:00 - 12:15	Precipitation (none); Wind (Beaufort 1-2, S); Cloud (2-7/8 Oktas); Visibility (very good > 3km); Temperature (11-12 °C)
5	27/06/2019	06:45 – 08:45	Precipitation (occasional drizzle); Wind (Beaufort 2, NW); Cloud (8/8 Oktas); Visibility (1-2 km); Temperature (14-15 °C)
6	12/07/2019	06:00 – 08:15	Precipitation (none); Wind (Beaufort 2-3, SE); Cloud (4-8/8 Oktas); Visibility (very good > 3km); Temperature (16-18 °C)

Table F.2 Non-breeding bird survey

Survey visit No.	Date	Start – finish	Time of High (H) or Low (L) tide	Weather conditions
1	09/10/2019	08:00-13:00	10:27 H	Light/heavy showers, Wind F3-4 SW, Cloud Cover 6-8/8, Visibility 1-3km Temp, 10-12c
2	24/10/2019	11:00-16:00	15:21 L	Light showers. Wind F3-4 SW-NW, Cloud Cover 6-8/8, Visibility >3km Temp, 10-11c
3	12/11/2019	09:00-14:00	12:30 H	Dry, Wind F3-4 N-NW, Cloud Cover 4-6/8, Visibility >3km, Temp 6-8c
4	22/11/2019	10:00-15:00	13:55 L	Light showers. Wind F2-4 NE, Cloud Cover 4-8/8, Visibility >3km, Temp 5-6c
5	06/12/2019	09:45-14:45	13:35 L	Heavy rain/light showers, Wind F2-3 W-NW, Cloud Cover -7-8/8, Visibility 1-3km, Temp 8-9c

Survey visit No.	Date	Start – finish	Time of High (H) or Low (L) tide	Weather conditions
6	13/12/2019	09:00-14:00	12:44 H	Dry, Wind F2-3 NW, Cloud Cover 1-2/8, Visibility >3km, Temp 4-6c
7	09/01/2020	09:30-14:30	11:07 H	Light showers, Wind F2-3 N-NE, Cloud Cover 2-7/8, Visibility >3km, Temp 3-6c
8	22/01/2020	11:15-16:15	16:02 L	Dry, Wind F1-2 W, Cloud Cover 7-8/8, Visibility >3km, Temp 8-9c
9	07/02/2020	08:4513:45	10:35 H	Dry, Wind F4 SE, Cloud Cover 2-7/8, Visibility >3km, Temp 4-7c
10	20/02/2020	12:00-17:00	15:48 L	Heavy showers/rain, Wind F5-6 W, Cloud Cover 4-8/8, Visibility >3km, Temp 4-5c
11	09/03/2020	08:30-133:30	11:54 H	Light rain, Wind F3-4 W, Cloud Cover 7-8/8, Visibility >3km, Temp 7-8c
12	18/03/2020	09:15-14:15	13:28 L	Light/heavy showers, Wind F2-4 SW, Cloud Cover 4-8/8, Visibility 1-3km to >3km, Temp 6-8c

Appendix G Breeding bird survey

Table G.1 Breeding birds survey 2019: gulls and jackdaw (total number of potentially breeding pairs)

Species name		30 April	21 May	04 June	19 June	12 July	23 July
Herring gull	Pairs	12	3	8	10	9	12
Herring gull	Singles	5	10	10	5	5	4
Jackdaw	Pairs	2	7	6	9	8	10
Jackdaw	Singles	2	1	5	1	3	3
Lesser black-backed gull	Pairs	6	2	1	2	1	1
Lesser black-backed gull	Singles	0	2	1	5	5	3
Oystercatcher	Pairs	1	2	2	1	2	0
Oystercatcher	Singles	0	4	2	1	4	2

Table G.2 Breeding bird surveys: total number of non-breeding birds recorded on each survey visit

Species name	Annex I	Scottish Biodiversity List	BoCC Red/Amber	30 April	21 May	04 June	19 June	12 July	23 July
Black guillemot			Amber				4	6	5
Blackcap				2					
Black-headed gull		Yes	Amber			1		3	13
Buzzard				1	2	1	1	1	
Canada goose				1					
Common gull			Amber		1		1	2	24
Common sandpiper			Amber					3	
Common tern	Yes	Yes	Amber				2	1	
Cormorant								2	
Curlew		Yes	Red	5				2	
Eider			Amber				1		
Great black-backed gull			Amber		1	2	3	2	2
Grey heron					1	1	1		1
Greylag goose			Amber	3	8	6	2	2	
Herring gull		Yes	Red		4	4	11	4	6
Kestrel		Yes	Amber		1				

Species name	Annex I	Scottish Biodiversity List	BoCC Red/Amber	30 April	21 May	04 June	19 June	12 July	23 July
Lesser black-backed gull			Amber		1	1	2		1
Mallard			Amber		2			3	
Mistle thrush			Red						9
Oystercatcher			Amber	12		3	4	4	3
Pheasant							1		
Redshank			Amber						1
Shag			Red			2	2	1	1
Shelduck	Yes		Amber			2		1	1
Starling		Yes	Red			11	11	14	53
Stock dove			Amber	1	1			1	
Swallow				2	9	3	4	9	6
Wheatear				1		1			

Appendix H Non-breeding bird survey

Table H.1 Non-breeding bird survey results

Species	09/10/19	24/10/19	12/11/19	22/11/19	06/12/19	13/12/19	09/01/20	22/01/20	07/02/20	20/02/20	09/03/20	18/03/20
Bar-tailed godwit	1											
Black guillemot	4	4		2			3	5	6		9	4
Blackbird	x	x	15	x	x	x	x	x	x	x	x	x
Black-headed gull	9	6	8	20	35	12	8	17	8	11	3	6
Blue tit	x	x	x	x	x	x	x	x	x	x	x	x
Bullfinch								x				
Buzzard	1	2	1	1	1	1	1	1	1	1	1	2
Cackling x barnacle goose hybrid										1		
Canada goose								2	13	9	2	4
Carrion crow	x	x	x	x	x	x	x	x	x	x	x	x
Chaffinch	x	x	x	x	x	x	x	x	x	x	x	x
Collared dove							x					
Common guillemot								2				
Common gull	15	150	28	4	34	7	25	34	75	48	26	12
Cormorant	2	21	6	14	3	2	1	3	4	4	2	2
Curlew	35	2	28	45	25	10	42	16	33	28	33	3
Dunlin	6	23	14	4	7			85	22			
Dunnock	x	x	x		x	x	x			x	x	x

Species	09/10/19	24/10/19	12/11/19	22/11/19	06/12/19	13/12/19	09/01/20	22/01/20	07/02/20	20/02/20	09/03/20	18/03/20
Eider	4	2	4	2		2	2	9	13	13	50	80
Feral pigeon	x		x		x	x				x		
Fieldfare		x			x	x	15	20	30	x	x	x
Goldcrest	x	x	x		x							
Golden plover					1							
Goldeneye								1				
Goldfinch	x	x	x	18		x	x	x	x	x	x	x
Great black-backed gull	3	1	2	1	1	1	1	2	1	2	2	1
Great tit	x	x	x	x		x	x	x	x	x	x	
Great-spotted woodpecker						x	x					x
Greenfinch				x	40	x		30	40	30	30	20
Greenshank								1				
Grey heron	2	2	2	1	2	1	1	1	1	1		
Grey wagtail	2						1	1				
Greylag goose	22	23		42		87	65	12	5	37	18	18
Herring gull	11	4	6	14	6	4	13	8	11	18	7	7
House sparrow				x		x		x	x	x	x	
Jackdaw	45		32	x	30	x	x	39	x	x	x	34
Jay						x						
Kestrel	1	1	1	1	1		1	1		1	1	
Knot	90								1			

Species	09/10/19	24/10/19	12/11/19	22/11/19	06/12/19	13/12/19	09/01/20	22/01/20	07/02/20	20/02/20	09/03/20	18/03/20
Lapwing									18		15	
Lesser black-backed gull										1	3	8
Linnet		35		15		x						x
Little egret			1	1	1	1		1	1		1	
Long-tailed tit		x						x			x	
Magpie	x	x	x	x	x	x	x	x	x	x	x	x
Mallard	23	2	22	12		8	20	7	8	22	14	2
Meadow pipit	x	x	x	30	x	x	x	x	x	x	x	x
Mistle thrush		x	x	x	x	x	x	x	x	x	x	x
Mute swan	4		7				2			2		
Oystercatcher	53	2	65	34	80	35	155	104	84	27	37	4
Peregrine			1		2	1					1	
Pheasant	x				1	x			x			x
Pied wagtail	17	12	13	x	x	x	x	x	x	x	x	x
Raven			1			1			1	2	2	1
Red-breasted merganser	17	2	2		4	1	1	6	3	2	2	2
Redshank	14	3	10	7	7	5	9	13	5	4	6	
Red-throated diver								2				
Redwing		x	x	25		x	30		50	40	70	60
Reed bunting			x	x	x		x			x		x
Ringed plover								12	2			

Species	09/10/19	24/10/19	12/11/19	22/11/19	06/12/19	13/12/19	09/01/20	22/01/20	07/02/20	20/02/20	09/03/20	18/03/20
Robin	x	x	x	x	x	x	x	x	x	x	x	x
Rock pipit	x	x	14	x	x	x	x	x	x	x	x	x
Rook	x											
Shag	4	3	17	5	14	8	23	8	15	6	9	5
Shelduck	2	2	26	30	26	29	18	23	21	16	23	9
Skylark												x
Snipe			1	3		4		1	1			
Song thrush	x	x	x	x	x	x	x	x	x	x	x	x
Sparrowhawk			1			1					1	1
Starling	60	48	x	x	x	x	x	22		50	45	x
Stock dove											x	
Stonechat						x		x				
Teal			16	22	17	16	28	1	24	17	25	22
Treecreeper							x				x	
Turnstone			55		8	75	13	4	4		7	
Twite						14						
Whooper swan	2											
Wigeon	165	60	200	90	75	25	45	18	9	25	28	6
Woodpigeon	x	x	x	x	x	x	x	x	x	x	x	x
Wren			x	x		x	x	x	x			x

Blank cells = not present; x = present but numbers below threshold level of 10.

Appendix 12A.

Designated Heritage Assets

Appendix 12A
Designated Heritage Assets

Listed buildings located within 5 km of the Site are provided in **Table 12A.1**.

Table 12A.1 Listed Buildings

Listing ref	Name	Category	Easting	Northing
LB852	New Lighthouse	B	213760	651514
LB51402	Ritchie Street, Overton Church, including boundary wall, gatepiers and gates	B	220297	648132
LB14309	Sundial, Kirktonhall	A	220521	648272
LB14308	Kirktonhall (Offices of Ayr County Council)	B	220505	648302
LB14306	West Kilbride Barony Parish Church and Graveyard	C	220637	648346
LB50774	73 Main Street and 1 Hunterston Road	C	220583	648375
LB14307	St Andrews (formerly St Brides), Church of Scotland	B	220667	648425
LB14312	West Kilbride Station	B	220872	648441
LB14279	Law Castle	A	221094	648416
LB14310	Monument in Cemetery to Dr. Robert Simpson	C	220663	648729
LB43209	Seamill Centre, Formerly Seamill House, With Lodge, Boundary Walls And Gatepiers	A	220448	647223
LB14285	Sea Mill	B	220202	647122
LB14281	West Cottage and Castle Cottage, Portencross	C	217568	648877
LB13899	Harbours, Portencross	B	217559	648936
LB14315	Hunterston Gate (South Pillars)	B	219980	650160
LB14313	Hunterston Castle	A	219285	651471
LB14288	Walled Garden, Hunterston	C	219212	651459
LB14286	Hunterston House	B	219207	651739
LB14287	Well in Front of Mansion	C	219201	651765
LB14314	Hunterston Gate (North Pillars)	B	220139	652102

Listing ref	Name	Category	Easting	Northing
LB7314	Fairlie Village 8 Burnfoot Road Burnside	B	220959	654713
LB7315	Fairlie Village Fairlie Castle	B	221283	654890
LB7316	Fairlie Village The Causeway Rockhaven	C	220888	655097
LB7293	Fairlie Village Hall	B	220985	655156
LB7291	Fairlie Village Fairlie Parish Hall (Former Free Church)	C	220987	655221
LB7292	Fairlie Village Fairlie School and gatepiers	B	221042	655254
LB51722	Fairlie, 59 Main Road, Fairlie Lodge, including boundary wall	C	220925	655317
LB7317	Fairlie Village Fairlie Parish Church	B	220984	220984
LB52288	The Robertson Building, Millport Field Centre, Marine Parade, Millport, Isle Of Cumbrae	C	217556	654509
LB37843	9, 10 Marine Parade, Eastwood	B	217253	655172
LB37839	Devenport Place, 14-25 (Odd and even numbers)	C	216958	655147
LB37842	Kelburn Street no. 6 and 7	C	216913	655095
LB37841	Kelburn Street no. 8 and 9	C	216932	655114
LB37840	Kelburn Street no. 10, 11, 12 and 13	C	216940	655124
LB37824	Episcopal Cathedral With Collegiate Buildings And Cloister	A	216577	655240
LB37825	The Garrison, Including Walled Garden And Entrance Gateways	B	216423	655029
LB37826	Old Harbour	B	216310	216310
LB37838	Strahoun Bute Terrace	C	216208	655059
LB37823	Bute Terrace, Former United Presbyterian Manse	C	216177	655118
LB37837	Seaview, Bute Terrace	C	216128	655021
LB37836	Springfield, Bute Terrace	B	216106	216106
LB37835	Fairlie Bank, Bute Terrace	C	216080	654986
LB50968	Millport, Bute Terrace, Cumbrae Parish Church (Church Of Scotland), Including Boundary Wall And Gatepiers	C	216041	654994
LB37830	Millburn House	B	215871	654796
LB37828	Mid-Kirkton	B	215787	655142

Listing ref	Name	Category	Easting	Northing
LB37827	Old Graveyard, Kirkton	B	215756	655168
LB37829	Kirkton House	B	215689	655232
LB19686	Carlung House	B	219566	649070
LB14283	Lawoodhead	B	221318	649106
LB14282	Crosbie Towers	B	221816	650059

Scheduled monuments located within 5 km of the Site boundary are provided in **Table 12A.2**.

Table 12A.2 Scheduled Monuments

Monument ID	Name	Easting	Northing
SM317	Fairlie Castle	221286	654892
SM333	Southannan Mansion House, Fairlie	220921	653845
SM3305	Castle Hill, Earthwork, Sse Of Glenside	220771	652553
SM3694	Castle Knowe,motte	220346	650826
SM3336	Bushglen Mount, ENE of Bushglen	221143	649864
SM2175	Auld Hillfort, Portencross	217829	649119
SM2195	Little Cumbrae Castle	215247	651342
SM418	Little Cumbrae, lighthouse tower & associated buildings	214308	651479

Conservation Areas located within 5 km of the Site boundary are provided in **Table 12A.3**.

Table 12A.3 Conservation areas

Name	Easting	Northing
Millport Conservation Area	216423	655039
West Kilbride Conservation Area	220489	648299

Gardens and Designated Landscapes located within 5 km of the Site are provided in **Table 12A.4**.

Table 12A.4 Gardens and Designed Landscapes

GDL ref	Name	Easting	Northing
GDL00233	Kelburn Castle	221620	656810

Non-designated assets located within 5 km of the Site are provided in **Table 12A.5**.

Table 12A.5 HER and Canmore records

ID	Source	Name	Easting	Northing
282002	Canmore	Hunterston, Tidal Ponds	217920	651630
282000	Canmore	Stoney Port	217900	651700
282004	Canmore	Hunterston, Landing Stage	217677	651657
40656	Canmore	Fences	218700	651300
40657	Canmore	Fences	218600	651500
82188	Canmore	Hunterston Nuclear Generating Station, 'B' Power Station	218542	651491
40666	Canmore	Hunterston, Nuclear Generating Stations	218350	651339
79623	Canmore	Hunterston Nuclear Generating Station, 'A' Power Station	218155	651235
5234	HERWOSAS	Fences	218700	651300
5235	HERWOSAS	Fences	218600	651500
55534	HERWOSAS	Hunterston, Landing Stage / Fairlie Roads	217677	651657
66202	HERWOSAS	Stoney Port	218075	651685
5582	HERWOSAS	Archaeological Mitigation: Hunterston North Substation, West Kilbride, North Ayrshire	218855	651321
67726	HERWOSAS	Hunterston	218784	651365
55533	HERWOSAS	Hunterston, Tidal Ponds / Stoney Port; Firth Of Clyde; Inner Clyde Estuary	217920	651630
13446	HERWOSAS	Hunterston 'A' Power Station / Hunterston Nuclear Generating Station	218250	651250
67724	HERWOSAS	Hunterston	218804	651111
768	HERWOSAS	Coastal Zone Assessment Survey, Firth Of Clyde. By Guard For Historic Scotland. Crg & Scape	216142	654501
5582	HERWOSAS	Archaeological Mitigation: Hunterston North Substation, West Kilbride, North Ayrshire	218855	651321
14108	HERWOSAS	Hunterston 'B' Power Station / Hunterston Nuclear Generating Station	218550	651450
5244	HERWOSAS	Hunterston, Nuclear Generating Stations / Hunterston Power Station	218540	651500

ID	Source	Name	Easting	Northing
5424	HERWOSAS	Archaeological Watching Brief: Western Link Northern Point Of Connection - Hunterston To Ardneil Bay	219072	648545
5359	HERWOSAS	Archaeological Mitigation: Hunterston Convertor And Substation, West Kilbride, North Ayrshire	218750	651210
5582	HERWOSAS	Archaeological Mitigation: Hunterston North Substation, West Kilbride, North Ayrshire	218855	651321
5582	HERWOSAS	Archaeological Mitigation: Hunterston North Substation, West Kilbride, North Ayrshire	218855	651321
55532	HERWOSAS	Stoney Port / Hunterston	217900	651700
67725	HERWOSAS	Hunterstone	218710	651110
5407	HERWOSAS	Hunterston Converter And Substation, West Kilbride, North Ayrshire: Strip Map Sample	218760	651160
5407	HERWOSAS	Hunterston Converter And Substation, West Kilbride, North Ayrshire: Strip Map Sample	218760	651160
5407	HERWOSAS	Hunterston Converter And Substation, West Kilbride, North Ayrshire: Strip Map Sample	218760	651160
5359	HERWOSAS	Archaeological Mitigation: Hunterston Convertor And Substation, West Kilbride, North Ayrshire	218750	651210
5405	HERWOSAS	Archaeological Mitigation, Area B: Hunterston East Substation, West Kilbride, North Ayrshire	218720	651240
5405	HERWOSAS	Archaeological Mitigation, Area B: Hunterston East Substation, West Kilbride, North Ayrshire	218720	651240
5402	HERWOSAS	Archaeological Monitoring: Hunterston Converter And Substation, West Kilbride, North Ayrshire	218340	650930
5404	HERWOSAS	Archaeological Evaluation And Building Recording: Goldenberry Farm, Hunterston Convertor And Substation, West Kilbride, North Ayrshire	218413	651072
5407	HERWOSAS	Hunterston Converter And Substation, West Kilbride, North Ayrshire: Strip Map Sample	218760	651160

Appendix 17A.

Major accident and disaster criteria for magnitude

Appendix 17A
Major accident and disaster criteria for magnitude

The EIA methodology in **Chapter 17: Major Accidents and Disasters**, **Section 17.6** describes the method used to assess the significance of a major accident and disaster effect for the Environmental Statement (ES). This appendix describes the magnitude criteria used to assess the damage/harm arising from a potential major accident and disaster, and the reasons for its selection. The criteria are specifically for application to the major hazard and disaster assessment and do not apply to other chapters.

Effects that are relevant to the Proposed Works but do not meet the magnitude thresholds of a major accidents and disaster event, are assessed in other chapters, for example **Chapter 7: Terrestrial and Freshwater Biodiversity** and **Chapter 8: Marine Biodiversity** if they are considered likely and reasonably foreseeable. This means that a comprehensive range of effects will be addressed under the different aspects of the ES overall.

Magnitude Criteria

These criteria are aligned to and largely extracted from definitions used in commonly applied major hazard guidance for the environment CDOIF[1] and risk tolerability criteria for people applied by the Health and Safety Executive[2].

The criteria in the CDOIF and HSE guidance for each receptor group was established with input from relevant specialists (such as ecologists and surface water specialists for non-human environmental criteria) to confirm the relevance and vulnerability of potential receptors (e.g. particular species) and, using their professional judgement, to provide input on the extent and nature of harm and recovery time.

In relation to major accidents and disasters magnitude criteria the following factors are important:

- For non-human receptor groups, both severity of harm, **Table 17.A1**, and duration of harm (i.e. its persistence - the recovery period over which the environment would be restored), **Table 17.A2** combine to establish the magnitude level, **Table17A.3**.
- For human receptors, both severity of harm (see **Table17A.4**) and the numbers of people affected (see **Table 17.A5**) combine to establish the estimate of magnitude level, as shown in **Table17A.6**.

In order to distinguish between potential major accidents of differing scale, the magnitude of potential major accidents and disasters are categorised into one of four categories: **Low**, **Medium**,

[1] Chemical and Downstream Oil Industries Forum (n.d.). Environmental Risk Tolerability for COMAH Establishments (online). Available at: https://www.sepa.org.uk/media/219154/cdoif_guideline__environmental_risk_assessment_v2.pdf (Accessed 22 April 2022)
[2] HSE (2001). Reducing Risk Protecting People (R2P2), HSE. (R2P2) (online) Available at: https://www.hse.gov.uk/risk/theory/r2p2.pdf (Accessed 22 April 2022).

High, and **Very High**. Any scenario which does not meet the criteria of a major accident or disaster is simply listed is **Not MA&D** (i.e., not major accident and disaster).

Receptor Sensitivity

Receptor sensitivity, which relates to the intrinsic value and/or sensitivity of receptors, is embedded within the 'severity of harm,' 'duration of harm' and number of people affected criteria to establish their threshold levels and scaling factors. For this reason, receptor sensitivity is not explicitly considered in the major accidents and disasters assessment.

Magnitude of Harm – Non-human Receptors Groups

The environmental (non-human) criteria have been directly extracted from that of the CDOIF guidance[2] which sets a maximum or minimum severity ranking for some receptors. Where this is the case, the severity of harm categories that do not apply to those receptors are noted as non-applicable (N/A) in **Table 17.A1**.

Four categories of severity of harm criteria are considered (see **Table 17.A1**):

- **Not Significant**[3]: Any scenario which does not meet the criteria of a major accident or disaster, then it is simply listed is **Not MA&D** (i.e. not major accident and disaster). This level of harm is below the minimum threshold determined for a major accident or disaster in the CDOIF[1] (for non-human receptor groups) guidance; and
- **Severe, Large, Very Large**: These represent increasing magnitudes of harm or damage to populations or environmental receptors.

In **Table 17.A1**, where two threshold parameters are given within a single category, e.g., <0.5 ha or 10% of a designated site of national importance, the lesser of the two is taken to be the threshold for a given receptor. This ensures there is no gap between the 'severity of harm' categories.

In line with the CDOIF[1] and Department for the Environment, Transport and Regions (DETR) guidance[4], destruction of Category B or C listed buildings are not considered to be a major accident as they are not considered to be historic and heritage assets of the highest significance under the Scottish listed building system of Category A, B & C[5]. However, if the incident which led to their destruction could endanger human life, or a relevant population of particular species, then it would be considered as a major accident under the appropriate receptor. However, Category A buildings are those of 'national architectural or historic importance' according to the DETR guidance[29] and are afforded an additional level of protection.

[3] The CDOIF guidance used the terminology of 'significant' for this severity of harm and defines it as a level of harm which might lead to significant pollution, but one which is not considered a major accident or disaster. While the CDOIF guidance uses the term 'significant' for this, this is very different to how the term is used in EIA and therefore this criterion term has been replaced by 'not significant' for EIA purposes.

[4] UK Government (2011). Guidelines for Environmental Risk Assessment and Management Green Leaves III (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69450/pb13670-green-leaves-iii-1111071.pdf (Accessed 22 April 2022).

[5] Historic Environment Scotland (2022) Categories of Listing. (online) Available at: https://www.historicenvironment.scot/advice-and-support/listing-scheduling-and-designations/listed-buildings/what-is-listing/#categories-of-listing_tab (Accessed 05 April 2022)

Table 17.A1 Major accidents and disasters severity of harm criteria (non-human receptor groups)

Receptor Type	Severity of harm			
	Not significant	**Severe**	**Large**	**Very Large**
Designated land/ water sites (internationally important)	<0.5 ha or <5% (<5% linear feature or population).	>0.5 ha or 5-25% of site area or 5-25% of associated linear feature or population.	25-50% of site area, associated linear feature or population.	>50% of site area, associated linear feature or population.
Designated land/ water sites (nationally important)	<0.5 ha or <10%.	>0.5 ha or 10-50% of site area, associated linear feature or population.	>50% of site area, associated linear feature population.	N/A.
Other designated land	<10 ha or <10%.	10-100 ha or 10-50% of land.	>100ha or >50% of land.	N/A.
Scarce habitat	<2 ha or <10%.	2-20 ha or 10-50% of habitat.	>20ha or >50% of habitat.	N/A.
Widespread habitat (non-designated land)	<10ha.	Contamination of 10-100 ha of land, preventing growing of crops, grazing of domestic animals or renders the area inaccessible to the public because of possible skin contact with dangerous substances. Alternatively, contamination of 10ha or more of vacant land.	100 – 1,000ha (applied as per text under 'Severe').	>1,000ha (applied as per text under 'Severe').
Widespread habitat (non-designated water)	N/A.	Contamination of aquatic habitat which prevents fishing or aquaculture or renders it inaccessible to the public.	N/A.	N/A.

Receptor Type	Severity of harm			
	Not significant	**Severe**	**Large**	**Very Large**
Particular species (these criteria apply nationally)	Loss of <1% of animal or <5% of plant ground cover in a habitat.	Loss of 1-10% of animal or 5-50% of plant ground cover.	Loss of 10-90% of animal or 50-90% of plant ground cover.	Total loss (>90%) of animal or plant ground cover.
Fresh and estuarine water habitats	Impact below that indicated to be severe.	WFD chemical or ecological status lowered by one class for 2-10 km of watercourse or 2-20 ha or 10-50% area of estuaries or ponds. Interruption of drinking water supplies, as per Groundwater Source of Drinking Water.	WFD chemical ecological status lowered by one class for 10-200km of watercourse or 20-200ha or 50-90% area of estuaries and ponds. Interruption of drinking water supplies, as per Groundwater Source of Drinking Water.	WFD Chemical or ecological status lowered by one class for >200km of watercourse or >200ha or >90% area of estuaries and ponds. Interruption of drinking water supplies, as per Groundwater Source of Drinking Water.
Marine	<2 ha littoral or sub-littoral zone, <100 ha of open sea benthic community, <100 dead sea birds (<500 gulls), <5 dead/ significantly impaired sea mammals.	2-20ha littoral or sub-littoral zone, 100-1,000ha of open sea benthic community, 100-1,000 dead sea birds (500-5,000 gulls), 5-50 dead/ significantly impaired sea mammals	20-200ha littoral or sub-littoral zone, 100-10,000 ha of open sea benthic community, 1,000-10,000 dead sea birds (5,000-50,000 gulls), 50-500 dead/ significantly impaired sea mammals.	>200ha littoral and sub-littoral zone, >1,000ha of open sea benthic community, >10,000 dead sea birds (>50,000 gulls), >500 dead/ significantly impaired sea mammals.
Groundwater source of drinking water	Interruption of drinking water supply <1,000 person-hours.	Interruption of drinking water supplied from a ground or surface source (where persons affected x duration in hours (at least 2) >1,000).	>1 x 10^7 person-hours interruption of drinking water (a town of ~100,000 people losing supply for month).	>1 x 10^9 person-hours interruption of drinking (~1 million people losing supply for 1 month).
Groundwater – non-drinking water source	<1ha.	1-100 ha of aquifer where water quality standards are breached (or hazardous substance is discernible).	100-10,000ha.	>10,000ha.
Soil or sediment	Contamination not leading to environmental damage (as per	Contamination of 10-100ha of land etc. as per widespread habitat; contamination sufficient to be	Contamination of 100-1,000ha of land, as per widespread habitat; contamination rendering the soil	Contamination of >1,000ha of land, as per widespread habitat; contamination rendering the soil

Receptor Type	Severity of harm			
	Not significant	**Severe**	**Large**	**Very Large**
	ELD), or not significantly, affecting overlying water quality.	deemed environmental damage (Environmental Liability Directive).	immediately hazardous to humans (e.g., skin contact) or the living environment, but remediation available.	immediately hazardous to humans (e.g., skin contact) or the living environment and remediation difficult or impossible.
Historic environment[6]	Damage below a level at which designation of importance would be withdrawn.	Damage sufficient for designation of importance to be withdrawn.	Feature of historic environment subject to designation of importance entirely destroyed.	N/A.

[6] Historic environment receptors are those where the NPPF considers their harm should be treated as 'wholly exceptional'. These are historic and heritage assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, Category A listed buildings, Inventory of Gardens and Designed Landscapes, and World Heritage Sites. Associated conservation areas that contribute to their significance are also included. Category B and C listed buildings will be assessed as non-designated land.

Duration of harm – non-human receptor groups

The duration of harm, i.e., the recovery period, is also a factor in establishing criteria for the magnitude relating to major accidents and disasters on non-human receptors. This is given in **Table 17.A2**. The criteria are taken directly from the CDOIF guidance[2].

In general terms a receptor which is able to recover quickly from an event is considered to have suffered a lesser level of harm than one that does not recover or recovers only after a very long time. This concept is recognised in the duration criteria, which takes account of the ability of the receptor to recover and the importance given to the receptor by society. Duration criteria therefore differ by receptor type, and what is considered short term for one receptor type is not the same as that of another.

Four categories of duration are considered: **Short, Medium, Long**, and **Very Long** term.

Table 17.A2 Major accidents and disasters duration of harm criteria (non-human receptor groups)

Description	Short term	Medium term	Long term	Very long term
Groundwater or surface water drinking water source (public or private)	N/A.	N/A.	Harm affecting drinking water source or SPZ <6 years.	Harm affecting drinking water source or SPZ >6 years.
Groundwater (except drinking water sources):	WFD hazardous substances <3 months.	WFD hazardous subs >3 months.	WFD hazardous subs >6 years.	WFD hazardous subs >20 years.
	WFD non-hazardous substances <1 year.	WFD non-hazardous substances >1 year.	WFD non-hazardous substances >10 years.	WFD non-hazardous substances >20 years.
Surface water (except drinking water sources - see above)	<1 year.	>1 year.	>10 years.	>20 years.
Land	<3 years.	>3 years or >2 growing seasons for agricultural land.	>20 years.	>50 years.
Historic environment	Can be repaired in <3 years, such that its designation can be reinstated.	Can be repaired in >3 years, such that its designation can be reinstated.	Feature destroyed, cannot be rebuilt, all features except world heritage site.	Feature destroyed, cannot be rebuilt, world heritage site.

Table 17A.3 provides a matrix which combines the factors of severity of harm/damage criteria (see **Table 17.A1**) with duration of harm criteria (see **Table 17.A2**) to establish magnitude criteria.

Table **Error! No text of specified style in document.**.A3 Magnitude matrix (non-human receptor groups)

Severity of Harm	Duration of harm			
	Short	**Medium**	**Long**	**Very Long**
Very Large	Not MA&D	**High**	**Very High**	**Very High**
Large	Not MA&D	**Medium**	**High**	**Very High**
Severe	Not MA&D	**Low**	**Medium**	**High**
Not Significant	Not MA&D			

Magnitude of Harm – Human Receptor Groups

The descriptions for population and human health severity criteria in **Table 17.A4** have been developed to include wider health, social and economic effects as well as direct physical harm. These effects are drawn from the Civil Contingencies guidance[15]. The descriptions incorporate relevant aspects of the health, social and economic effects in the guidance, tailored to the severity of harm levels used in **Table 17.A4** and major accidents and disasters that are relevant to the Proposed Works.

As for non-human receptors, four categories of severity of harm criteria (see **Table 17.A4**) are considered:

- **Not Significant:** simply listed as **Not MA&D** (i.e., not major accident and disaster). This level of harm is below the minimum threshold determined for a major accident or disaster in Reducing Risk Protecting People (R2P2)[3] (for human receptor groups); and
- **Severe, Large, Very Large:** These represent increasing magnitudes of harm or damage to populations or environmental receptors.

Where the severity of harm is at the **'not significant'** and **'severe'** level, the severity of harm criteria for workers differs from that for members of the public. This is consistent with HSE's R2P2[3] which reasons that individual members of the public 'have the risk imposed on them 'in the wider interest of society' whereas workers accept the risk, have more control over it and benefit from the activity. It is also easier to separate the public from the hazard and therefore reduce their risk.

Where the severity of harm is **'large'** or **'very large'** i.e., a substantial number of fatalities and life changing injuries arise from a single event, the severity of harm is the same for the workers as for the public. In setting criteria for societal risk, the HSE does not make the distinction between workers and the public.

Where the severity of harm is **'large'** or **'very large'** the wider health, social and economic effects that apply differ slightly, reflecting the differences in how the public and workers may be affected. For example, damage to residential properties is an effect upon the public and is not applicable to workers.

Table 17.A4 Major accidents and disasters severity of harm criteria (human receptor groups)

Receptor Type	Severity of harm			
	Not significant	**Severe**	**Large**	**Very Large**
Human populations (public)	Small number of minor injuries.	Substantial number of people requiring medical attention. Events of this magnitude may also involve some damage to housing, with low numbers of people being displaced. Potential for localised interruption to utilities and damage to infrastructure.	Multiple life changing injuries and/ or potential loss of life in low numbers Events of this magnitude are also likely to involve: • many people requiring medical treatment; • many people suffering long term mental health issues related to the event; • housing and business premises rendered uninhabitable with many people displaced for extended periods; • Serious adverse medium-term economic effects locally; • high clean-up and recovery costs to the local community; • potential for disruption to regional infrastructure, utilities and services; and • incident requiring emergency response at County/Regional scale.	Potential loss of life in high numbers and/or substantial number of life changing injuries Events of this magnitude are also likely to involve: • very many people requiring medical treatment; • widespread mental health issues related to the event; • large areas of housing and business premises rendered uninhabitable with large numbers of people displaced for long extended periods; • extensive adverse long-term economic effects regionally and nationally; • extensive clean-up and recovery costs to society; • potential for disruption to regional infrastructure, utilities and services; and • incident requiring emergency response at National/International scale.
Human populations (workers)	Substantial number of people requiring medical attention.	Multiple life changing injuries.	Multiple life changing injuries, potential loss of life in low numbers. Events of this magnitude are also likely to involve:	Potential loss of life in high numbers and substantial number of life changing injuries. Events of this magnitude are also likely to involve:

Receptor Type	Severity of harm			
	Not significant	Severe	Large	Very Large
			• many people suffering long term mental health issues related to the event; • serious adverse medium-term economic effects to locally; • high clean-up and recovery costs to the local community; • potential for disruption to regional infrastructure, utilities and services; and • incident requiring emergency response at County/Regional scale.	• widespread mental health issues related to the event; • extensive adverse long-term economic effects regionally and nationally; • extensive clean-up and recovery costs to society; • potential for disruption to regional infrastructure, utilities and services; and • incident requiring emergency response at National/International scale.

Number of people affected

For human receptors the magnitude is categorised based on the number of people affected (see **Table 17.A5**) to provide appropriate positioning against HSE risk tolerability concepts[3].

Table 17.A5 Number of people affected (human receptor groups)

	Number of people affected		
	Low	**Medium – High**	**Very High**
Human Populations	Less than 5	10s of people	100s of people

The combination of harm severity and people affected for human receptors to determine magnitude is given in **Table 17.A6**.

Table 17.A6 Major accidents and disasters duration of harm criteria (non-human receptor groups)

Severity of Harm	**Number of people affected**	
	Low to High	**Very High**
Very Large	**High**	**Very High**
Large	**Medium**	**High**
Severe	**Low**	**Medium**
Not Significant	Not MA&D	

wood.