FINDHORN HINTERLAND BAP 2019-2024

APPENDIX 1 – PRIORITY HABITATS AND SPECIES

Table 1. Hinterland Priority Habitats

Priority Level	Habitat	Associated Key Species	Management policy/Actions
1	Sand/shingle, dune heath	Lichens Invertebrates	Development and deployment of a public relations/education strategy to: raise the profile of sand/shingle and dune heath; the need for gorse and tree control; and promote consistent messages in all communications, including via website, local press, printed materials, events, meetings, work parties. See Appendix 3, Table 1. Removal of encroaching gorse and trees from priority lichen beds, to within 5m where possible, using a hired excavator to mulch the gorse plants remove the brash and humus, creating around 1ha of bare sand and shingle. See FHT Management plan 2019-2023. Mulch around 2ha of gorse and maintain as dune heath, see Dune Scrub, below. Remove soil humus in some areas to create bare sand and shingle (Appendix 3, Fig.1). Careful planning of path routes to avoid priority lichen areas. Establish a method for monitoring the status of SBL lichens, including the impact of human trampling on lichen areas, such as regular photography of key areas.
2	Species rich grassland (mainly around the turbines)	Linnet Yellowhammer Cuckoo Long-eared owl Kestrel Common toad Common lizard Slow worm Hedgehog Brown Hare Bats Small heath Common blue	Survey to identify most flower-rich areas to protect from summer grazing and expand through gorse removal. Manage grazing to allow summer flowering (end April to mid-September) on the most valuable areas of open grassland and gorse glades. Leave some tussocky grassland and gorse glades un-grazed/grazed very infrequently. Create reptile hibernacula/refuges – log piles. Install temporary signs April-August: “Baby deer and hares – please keep dogs on leads in this area”.

		Dark green fritillary 15 Priority moth species Roe deer Rabbits	
3	Dune scrub	Linnet Yellowhammer Cuckoo Common toad Insects Bats Roe deer Rabbit	Mulch 2ha of gorse scrub, using a hired tractor-mounted flail, connecting-together the Central and Eastern Dune heaths with the open dunes beyond (Appendix 3, Fig. 1). Mowing firebreaks and butterfly glades in late autumn/winter, to avoid breeding season.
4	Coniferous woodland - plantation	Redpoll Crossbill Spotted flycatcher Song thrush Bullfinch Long eared owl Common toad Red squirrel Hedgehog Pine marten Brown long-eared bat Pipistrelle bat Roe deer Speckled wood Creeping ladies tresses Lichens Fungi	Identification and protection of future 'veteran' trees, which will be allowed to grow old, die and decay naturally, with due regard to safety. Provide new fallen deadwood annually, including large branches/logs. Map and mark squirrel nesting dreys each year in early spring. 'No felling' policy April – August, to minimise disturbance to breeding mammals and birds. Target any felling between January and March at areas with no dreys. Maintain corridors of high canopy connectivity for squirrel travel as much as posible. Maintain some areas of birch thicket for hedgehogs, amphibians, invertebrates and breeding birds. Maintain some un-thinned areas of dense forest for squirrels and breeding birds.

Table 2. List of priority mammals at Hinterland

MAMMALS	Priority for Action (H,M,L)	Scottish Biodiversity List	Local Interest	Special legal protection	Associated Habitat	Notes
Pine marten	H	•		•	Woodland	Likely to be transient
Brown long-eared bat (? tbc)		•		•	Woodland	Priority for survey, to establish status
Pipistrelle bat species	H	•		•	Woodland	Known to be common
Red squirrel	H	•		•	Woodland	Vulnerable isolated population
Hedgehog	H	•			Woodland Acid grassland	Likely to use adjoining gardens
Brown hare	M	•			Acid grassland	Turbines area
Badger	M		•		Woodland Acid grassland	Priority for monitoring
Roe deer	M		•		Woodland Acid grassland	Provides important ecosystem services
Rabbit	M		•		Acid grassland	Provides important ecosystem services

Table 3. List of priority reptiles and amphibians at Hinterland

SPECIES	Priority for Action (H,M,L)	Scottish Biodiversity List	Local Interest	Associated Habitat	Notes
Common lizard	H	•		Acid grassland	Priority for survey, to establish status
Slow worm (tbc)	H	•		Acid grassland	Priority for survey, to establish status
Common toad	M	•		Ponds Woodland Dune scrub	
Smooth newt	L		•	Ponds Woodland	
Palmate newt	L		•	Ponds Woodland	

Table 4. List of priority birds at Hinterland

BIRDS	Priority for Action (H,M,L)	Scottish Biodiversity List	Red Listed	Local Interest	Special legal protection	Associated Habitat	Notes
Skylark	L	•	•			Dune heath	
Redpoll	M	•	•			Woodland	Will benefit from winter garden feeding
Linnet	H	•	•			Dune scrub Acid grassland	
Cuckoo	H	•	•			Dune scrub	
Siskin	M	•				Woodland	Will benefit from winter

							garden feeding
Yellowhammer	H	•	•			Dune scrub Acid grassland Surrounding gardens	Will benefit from winter garden feeding
Crossbill	L	•*				Woodland	*Scottish crossbill only
Spotted flycatcher	H	•	•			Woodland Ponds	
House sparrow	L	•	•			Surrounding gardens	
Dunnock	L	•				Woodland	Thicket areas
Starling	L	•	•			Surrounding gardens Acid grassland	Will benefit from winter garden feeding
Song thrush	H	•	•			Woodland Surrounding gardens	Thicket areas
Bullfinch	M	•				Woodland	Thicket areas
Kestrel	H	•				Dune heath Acid grassland	
Long-eared owl	H			•	•	Woodland Dune heath Acid grassland	
Crested tit	L			•		Woodland	Spring visitor

Table 5. List of priority bees, wasps and beetles

SPECIES	Priority for Action (H,M,L)	Scottish Biodiversity List	Local Interest only	Associated Habitat	Notes
Moss carder bee (tbc)	M	•		Acid grassland	Priority for survey
Red-banded sand wasp (tbc)	H	•		Dune heath	Priority for survey
Green tiger beetle	L		•	Dune heath	

Table 6. List of priority butterflies and moths occurring on Hinterland

SPECIES	Priority for Action (H,M,L)	Scottish Biodiversity List	Local Interest only	Associated Habitat	Notes
Small heath butterfly	M	•		Acid grassland Dune scrub	
Common blue butterfly	L		•	Acid grassland Dune scrub	
Dark green fritillary butterfly	L		•	Acid grassland	
Dingy skipper butterfly (tbc)	M	•		Acid grassland	Priority for survey, to establish status
Speckled wood butterfly	L		•	Woodland	
Cinnabar moth	M	•		Acid grassland	
Brown-spot pinion	M	•		Acid grassland Woodland	
Ear moth	M	•		Acid grassland	

Mouse moth	M	•		Acid grassland Woodland	
Shoulder-striped wainscot moth	M	•		Acid grassland	
Garden tiger	M	•		Acid grassland	
Small phoenix	M	•		Acid grassland Woodland	
Grey mountain carpet	M	•		Dune heath	
Autumnal rustic	M	•		Dune heath Acid grassland	
Garden dart	M	•		Acid grassland	
White line-dart	M	•		Dune heath Acid grassland	
Rosy minor moth	M	•		Acid grassland	
Rosy rustic moth	M	•		Acid grassland	
Lunar yellow underwing		•		Acid grassland	
Shaded broad-bar moth	M	•		Acid grassland	
White ermine moth	M	•		Acid grassland	
Anomalous moth	M	•		Acid grassland Dune heath Woodland	

Table 7. List of damselflies and dragonflies at Hinterland

SPECIES	Priority for Action (H,M,L)	Scottish Biodiversity List	Local Interest only	Associated Habitat
Common blue damselfly	L		•	Ponds, woodland
Blue-tailed damselfly	L		•	Ponds, woodland
Emerald damsel fly	L		•	Ponds, woodland
Common darter dragonfly	L		•	Ponds, woodland
Southern hawker dragonfly	L		•	Ponds, woodland
Common hawker dragonfly	L		•	Ponds, woodland

Table 8. List of priority flies occurring on Hinterland

SPECIES	Priority for Action (H,M,L)	Scottish Biodiversity List	Nationally Scarce	Associated Habitat	Notes
Flea bee-fly (robber fly) *Phthiria pulicaria*	H	•	•	Dune heath	Preys on insects. Determine local distribution and habitat requirements to target action.
Pied-winged robberfly *Pamponerus germanicus*	H		•	Dune heath	Adults feed on flowers. Determine local distribution and habitat requirements to target action.
Metopia tshernovae	H			Not known	New to Britain 2019. Nests in ground nesting wasp and bee nests. Determine local distribution and habitat requirements to target action.

Table 9. List of priority flowering plants occurring on Hinterland

SPECIES	Priority for Action (H,M,L)	Scottish Biodiversity List	Local Interest	Associated Habitat
Creeping lady's tresses	M		•	Woodland
Birdsfoot trefoil	M		•	Acid grassland. Key butterfly food plant
Dog violet	M		•	Acid grassland. Key butterfly foodplant

Table 10. Priority fungi occurring on Hinterland

SPECIES	Priority for Action (H,M,L)	Scottish Biodiversity List	Red Data Listed	Local Interest	Associated Habitat
Pucciniastrum goodyerae	H	•	•		Coniferous woodland
Xylaria polymorpha	M			•	Sand/shingle, dune heath, acid grassland
Sandy earthtongue *Sabuloglossum arenarium*	M			•	Sand dunes, dune heath
Moor club *Clavaria argillacea*	M			•	Sand dunes, dune heath
Earpick fungus *Auriscalpium vulgare*	M			•	Coniferous woodland

Flaming scalycap *Pholiota flammans*	M			•	Coniferous woodland
Dune brittlestem *Psathyrella ammophila*	M			•	Sand dunes

Table 11. List of Priority Lichens occurring on Hinterland

SPECIES	Priority for Action (H,M,L)	Scottish Biodiversity List	Local Interest	National status	Associated Habitat
Buellia jugorum	M		•	Rare	Dune shingle
Cladonia mitis	H	•		Rare	Sand and gravel
Cladonia unicalis subsp. unicalis	H	•		Rare/occasional	Sand and gravel
Ochrolechia frigida f. *Lapuensis*	M		•	Rare	Sand and gravel
Matt felt lichen *Peltigera malacea*	H	•		Rare	Sand and gravel
Stereocaulon glareosum	H	•		Rare	Sand and gravel
Melaspilea interjecta		•		Rare	Dune shingle
Rhizocarpon cinereovirens	M	•		Rare	Dune shingle

APPENDIX 2 – KEY SPECIES MANAGEMENT ACTIONS

Table 1. Key management for mammals

Species	Management Actions
Red squirrel	• No felling policy April to July. Any felling between January and March should be targeted in areas with no dreys. • Restrict tree-feeling to clearly identified blocks, ensuring 'chainsaw-free' woodland blocks, as squirrel refuges. • Survey of active dreys each late winter/early spring. • Maintain corridors of high of tree canopy connectivity to allow squirrels to travel easily. • Raise the profile of squirrel predation by cats in the local community and encourage use of cat bells and 'birds be safe' collars.
Hedgehog	• Provision of large woodland brash piles for hibernation. • Maintenance of areas of woodland with a dense shrub layer, including thickets. • Grassland management to maintain a mosaic of grazed and un-grazed areas, with scattered scrub.
Pine marten	• Provide brash piles and maintain tussocky grass to encourage vole populations. • Maintain pony grazing on acid grassland to benefit rabbits.
Brown hare	• Maintenance of a mosaic of grazed and un-grazed grass with scattered scrub around the turbines. • Designate the turbines area as a dogs-on-leads 'Wildlife Sanctuary' during the spring and summer.
Bats	• Maintenance of varied woodland edges and large patches of scrub on adjoining grassland. • Survey to determine presence of brown long-eared bat, including of old bomb shelters for roosting sites. • Provision of bat boxes.
Badger	• Survey to determine location of any setts, latrines and paths.
Roe deer	• Raise profile of value to dune heath habitats within the local community. • Designate the turbines area as a dogs-on-leads 'Wildlife Sanctuary' during the spring and summer.
Rabbit	• Raise profile of value to dune heath habitats within the local community.

Table 2. Key management for herptiles

Species	Management Actions
Common lizard, Slow worm	• Priority area is around the wind turbines. • Maintain large patches of tussocky open grassland – un-grazed/very infrequently grazed -with scattered scrub. • Provide log/rubble piles for refuges and hibernacula. • Clear gorse to create new sheltered glades, un-grazed from end of April to mid-September.
Common toad	• Provide woodland brash piles. • Maintain large patches of tussocky open grassland with scattered scrub – un-grazed/very infrequently grazed. • Provide log/rubble piles for refuges and hibernacula.
Newts	• Leave patches of tussocky open grassland - un-grazed/very infrequently grazed - with scattered scrub. • Provision of log/rubble piles for refuges and hibernacula near the ponds.

Table 3. Key management for birds

Species	Management Actions
Skylark (Mainly on adjoining agricultural grassland)	• Prevent gorse encroachment on open grassland around the turbines.
Redpoll	• Maintain areas of birch thicket.
Linnet	• Maintain a mosaic of gorse thickets (nesting) adjoining grassland (feeding – insects & seeds). • Create around 2ha of food-rich dune heath/acid grassland. • Winter grazing to allow flowering and setting of seeds.
Cuckoo	• Maintain small areas of birch/scrub thicket to encourage host species e.g. dunnock.
Yellowhammer	• Maintain gorse thicket (nesting) adjoining grassland (food - insects, seeds). • Create around 2ha of food-rich dune heath/acid grassland. • Winter grazing to allow flowering and setting of seeds.
Crossbill	• Continue woodland management.
Spotted flycatcher	• Maintain open rides/glades in woodland.
House sparrow (Mainly around houses)	• Will benefit from winter grazing to allow flowering and setting of seeds.

Dunnock	• Maintain small areas of thicket woodland. • Provide brash piles for nesting. • Maintain gorse thickets adjoining grassland.
Starling (Mainly around houses)	• Will benefit from short-grazed areas in pony paddocks.
Song thrush	• Maintain small areas thicket woodland. • Maintain gorse thickets adjoining grassland.
Bullfinch	• Maintain birch dominated areas.
Long-eared owl	• Maintain some un-thinned denser woodland areas. • Provide nesting baskets. • Provide woodland brash piles to encourage prey species (voles, mice). • Leave some open grassland areas un-grazed/grazed very infrequently to encourage prey species (voles, mice).
Kestrel	• Prevent gorse encroachment on grassland through mowing. • Leave some open grassland areas un-grazed encourage prey species (voles, mice).
Crested tit	• Preservation of large standing dead trees.

Table 4. Key management for invertebrates

Species/Taxon	Management Actions
Moss carder bee (priority area is around the wind turbines)	• Confirm status. • Identify food plant areas – birds foot trefoil, kidney vetch, red clover. • Allow some large areas of species-rich grassland to flower from the end of April to late September. • Leave patches of un-grazed tussocky grass in the turbines as over-wintering areas.
Red-banded sand wasp	• Confirm status.
Butterflies and moths (Priority area around wind turbines)	• Clear small patches of gorse to open-up new glades. • Light autumn/winter grazing of some gorse glades each year. • Allow some large areas of species-rich grassland to flower from the end of April until mid-

	September. • Leave patches of un-grazed tussocky grass in the turbines as over-wintering areas. • Identify main colonies and food plant area (birds foot trefoil, kidney vetch, white clover, dog violet). • Leave ragwort if more than 40m from a grazed area.
Flies	• Determine local distribution and habitat requirements of three key species to target action

Table 5. Key Management for flowering plants

Species	Management Actions
Creeping laides tresses, birdsfoot trefoil, dog violet	Survey and monitoring

Table 6. Key management for non-flowering plants

Taxon	Management Actions
Lichens	• Remove all gorse within 5m of all the priority lichen areas identified in the FHT Management Plan, 2019-23, covering around 1ha over five years. Remove brash and leaf litter - and if possible roots, using an excavator - from site and scrape to bare sand, to create areas for new lichen colonisation. • Cut around 2ha of gorse, connecting the Central and Eastern Dune Heaths and opening-up the main gorse area to higher windspeeds. Use excavator to gorse roots and humus in the cleared areas to create patches of sand/shingle for lichen colonisation (Appendix 3 Map 1). • Annual maintenance to remove tree and gorse seedlings from cleared areas. • Devise simple research programme to assess the level of damage by human trampling and the level of disturbance which is beneficial to lichens. • Monitor lichen/dune heath recovery in each priority area using digital mapping and photography. • Manage the flow of visitors by maintaining recognised pathways and using gorse thickets and signage to steer visitors away from sensitive areas. • Install interpretative panels on best lichen beds. • Provide a regular supply of deadwood – standing and fallen – each year within the woodland.

	• Identify and protect future veteran trees.
Mosses	• Survey to establish baseline. • Provide a regular supply of deadwood – standing and fallen – each year within the woodland. • Identification and protection of veteran trees.
Fungi	• Survey to establish baseline. • Provide a regular supply of deadwood – standing and fallen – each year within the woodland. • Identification and protection of veteran trees.
Slime moulds	• Survey to establish baseline. • Provide a regular supply of deadwood – standing and fallen – each year within the woodland. • Identification and protection of veteran trees.

APPENDIX 3 – WORK PROGRAMME

Table 1. Priority work projects 2020-2025

Project	Year
Establishment of a public relations strategy to promote consistent messages in all communications, including via: website, articles, printed materials, events, meetings, work parties. Key messages: rare sand dune habitats under threat; national importance for lichens; responsible land stewardship; hierarchy of habitat value; ecological succession; the need for tree and gorse removal; FHT has planted around 5,000 trees; threat of invasive species; cat predation of squirrels; the ecological value of rabbits and deer; trampling of lichens	2020
Creation of around 1ha of sand and shingle through removal of gorse plants, using a hi-mac excavator. Targeted at priority lichen areas in newly-cut gorse around the Central and Eastern Dune Heaths	2020-2025
Cutting around 2ha of tall gorse to join the Central and Eastern Dune Heaths and open them up to the wider dunes	2020-2025
Explore collaborative tree and gorse removal with Findhorn Dunes Trust	2020-2025
Establishment of an Excel species database	2020
Establishment of a survey programme for key priority species	2021
Establishment of GIS habitat and species mapping system	2021
Completion of tree and gorse clearance from all priority dune heath areas, using contractor with hi-mac excavator	2022
Completion of gorse removal from established acid grassland in the turbines area	2023
Identification of future veteran trees (taking public safety fully into account)	2023
Collaborative tree removal with Findhorn Dunes Trust	2023-2025

Table 2. Timing of Annual Tasks

Task	Month
Tree removal & scrub control	October - March
Maintenance of cleared areas – priority lichen areas and glades in gorse	October - March
Maintain firebreaks	October - March
Squirrel drey survey	Aug & March
Bird & bat box maintenance	October
Tree thinning	September-January
Invasive species monitoring	On-going

APPENDIX 4. OUTLINE PUBLIC RELATIONS STRATEGY

AUDIENCE	MESSAGES	METHOD
Local community	Rare sand dune habitats are under threat National importance for lichens Key species & habitats Hierarchy of habitat value Ecological succession Responsible land stewardship The need for tree and gorse removal FHT has planted more than 5,000 trees Cat predation of squirrels - collars The ecological value of rabbits and deer Trampling of lichens Threat of invasive garden plants Good news – eg species/habitat gains	Website Interpretative signs FHT members email - progress/plans updates twice a year Rainbow Bridge newsletter – progress/plans updates twice a year Occasional Sunday Slot Events/open days – inc. AGM
General public/visitors	Key species & habitats National importance for lichens Rare sand dune habitats under threat Ecological succession Responsible land stewardship FHT has planted more than 5,000 trees Good news – eg species/habitat gains	Website Events/open days – including schools Interpretative signs Forres Gazette – press release once a year.
Statutory agencies	Responsible land stewardship	Site visits – SNH, Moray Council
Potential funders	Rare sand dune habitats under threat National importance for lichens Key species and habitats The need for tree and gorse removal – costs	Identify most relevant funding bodies Make personal contact – site visits if possible Grant applications
External experts	National importance for lichens Key species & habitats The need for tree and gorse removal Welcome input	Maintain contact with national lichen experts Outreach via Universities, UK (+ European) sand dune restoration schemes