SSSI CONDITION MONITORING

SAND DUNE RECORDING FORM

Site name	Strathy Coast
Surveyor and date	Ian Strachan 4-6 Sep 2016

Number of shaded boxes ticked				
Sub-feature sections completed (check boxes)	**Strand etc**	**Fixed**	**Heath**	**Slack**
	X	X		X

Details of any aerial photography or other reference used to determine any change in extent:

Air photos 2016

1 = Melvich Bay, 2 = Armadale Bay, 3 = Strathy Bay (walk and transect combined for each bay)

The following is a quantitative definition of frequency, intended to assist with the assessment of several of the sand dune attributes. This is a version of the well-known DAFOR scale which has been adapted to the particular characteristics of sand dune:

- **Dominant:** the species appears at most (>60%) stops and it covers more than 50% of each sampling unit.
- **Abundant:** species occurs regularly throughout a stand, at most (>60%) stops and its cover is less than 50% of each sampling unit.
- **Frequent:** species recorded from 41-60% of stops.
- **Occasional:** species recorded from 21-40% of stops.
- **Rare:** species recorded from up to 1-20% of stops.

SUB-FEATURE OF INTEREST: STRAND, EMBRYO AND MOBILE DUNES

Attribute	**Target**	**Condition choice**	**Transect and/or walk #**					**Decision for SSSI**
			1 Melvich	**2 Armadale**	**3 Strathy**	**4**	**5**	
Extent*	Area maintained (i.e. no net decrease). The only acceptable form of loss is that due to natural coastal erosion.	Yes - Favourable	X	X	X			X
		No - see report						
	Area increased (leave blank if no net accretion)	Yes – Favourable		X				X
Physical	No further anthropogenic increase in	Yes - Favourable	X	X	X			X

structure: functionality and sediment supply*	factors leading to the decrease of natural mobility in the system. Natural circulation of sand and organic matter retained.	No - see report						
	Coastal defences absent	Yes - Favourable	X	X	X			X
	Coastal defences present	Yes - see report						
Vegetation structure: range of zones*	Zonation from beach to fixed dune intact over at least 95% of frontage	Yes - Favourable	X	X	X			X
		No - see report						
	If strand and embryo dune transitions to saltmarsh were present in the SSSI in earlier NVC survey, are they still present at least rarely? (leave all boxes blank if no strand or embryo dune recorded in NVC survey)	Yes - Favourable	X					X
		No - see report						
Vegetation composition: typical species*	Healthy *Ammophila arenaria* and/or *Leymus arenarius* with flowering heads frequent	Yes - Favourable	X	X	X			X
		No - see report						
Doesn't include the species listed as Scotland only.	At least one of the following species at least frequent and another occasional on strand:							
	Cakile maritima		R	O	R			
	Honckenya peploides		R	F				
	Atriplex sp		R	O				
	Salsola kali							
	Polygonum oxyspermum			O				
	Mertensia maritima							
	Galium aparine							
	Tripleurospermum maritimum							
	Potentilla anserina							
	Catabrosa aquatica							
	Leymus arenarius			R				
	Elytrigia repens							
	At least one of above frequent and another occasional	Yes – Favourable		X				X
		No – see report	X		X			
	Elytrigia juncea present on embryo dunes or mixed with *Ammophila arenaria* and/or *Leymus arenarius* in mobile dune zone	Yes – Favourable	X	X	X			X
		No – see report						
	Ammophila arenaria and/or *Leymus arenarius* at least abundant in foredunes	Yes – Favourable	X	X	X			X
		No – see report						
	Ammophila arenaria at least frequent in large blowouts and mobile dunes developed in the dune interior	Yes – Favourable	X	X	X			X
		No – see report						
Vegetation composition: negative indicator species*	*Hippophae rhamnoides* absent Use target notes to report presence	Yes – Favourable	X	X	X			X
		No – see report						
	Other non-native species no more than rare (give target notes if present at all)	Yes- favourable	X	X	X			X
		No – see report, use DAFOR						
	Any one of the following no more than frequent throughout sward, or singly or together the cover no more than 5%: (give target notes if present at all): *Senecio jacobaea*, *Cirsium arvense*, *Cirsium vulgare*, *Urtica dioica*, *Lolium perenne*, *Arrhenatherum elatius*	Yes- favourable	X	X	X			X
		No – see report, use DAFOR						
Other negative indicators*	Mechanical beach cleaning absent	Yes - Favourable	X	X	X			X
		No - see report						
	Sand or shingle extraction absent	Yes - Favourable	X	X	X			X
		No - see report						
Use target	Agricultural ploughing of mobile dunes	No - Favourable	X	X	X			X

notes even if present but favourable	occurring	Yes - see report						
	Vehicle damage absent	Yes - Favourable	X	X	X			X
		No - see report						
	Visitor damage (trampling, digging, jumping, sledging, fires, litter) absent or only rare/occasional	Yes - Favourable	X	X	X			X
		No - see report						
	Continuous lengths of bare sand paths >0.5 m wide absent or never more than rare	Yes - Favourable	X	X	X			X
		No - see report						
	Maintained paths (e.g. boardwalk) always in good condition (leave blank if absent)	Yes - Favourable						
		No - see report						
	Recent dune restoration work (last 5 years) never more than rare	Yes - Favourable	X	X	X			X
		No - see report						
	Stock damage (including horse or pony) to outer dunes rare or absent	Yes - Favourable	X	X	X			X
	Stock damage to outer dunes more than rare	Yes - see report						
	Winter feeding of stock absent from mobile dune zone	Yes - Favourable	X	X	X			X
		No - see report						
	Ammophila or *Leymus* able to set seed	Yes - Favourable	X	X	X			X
		No - see report						
Indicators of local distinctiveness [* if notified for any of these]	List specific to site (note that rare vascular plants must be monitored separately, but mention where found if noted during coastal SCM) *Polygonum oxyspermum ssp raii*			X				X

SUB-FEATURE OF INTEREST: FIXED DUNES

Attribute	Target	Condition choice	Transect and/or walk #					Decision for SSSI
			1 Melvich	2 Armadale	3 Strathy	4	5	
Extent*	No net loss in extent except as part of change to other dune habitats as part of natural processes (e.g. losses to bare sand, mobile dune, slack or dune heath are all acceptable forms of loss)	Yes - Favourable	X	X				
		No - see report			X			X
Vegetation structure: range of zones* Integrity – transitions	Transition inland from beach to fixed dune foredune (and around large blowouts) intact over 95% or more of frontage (interchange between the two types is allowable - a natural process)	Yes - Favourable	X	X	X			X
		No - see report						
	Existing sequences from calcareous to acidic dune grasslands, recorded in NVC surveys, maintained (interchange between the two types is allowable - a natural process)	Yes - Favourable	N/A	N/A	N/A			N/A
		No - see report						
	Transition to terrestrial habitat(s) intact	Yes - Favourable	X	X	X			X
		No - see report						
Vegetation structure: bare ground*	Bare ground or sand present but no more than 10% of total area	Yes - Favourable		X	X			X
		No - see report	X					
Vegetation structure: sward height*	30-70% of sward comprises species-rich short turf, 2-10cm tall	Yes - Favourable			X			
		No - see report	X	X				X
Vegetation structure: flowering and fruiting*	Flowering and fruiting of dune grassland at least frequent (use DAFOR)	Yes - Favourable	X	X	X			X
		No - see report						
Vegetation composition: typical species* ***Scottish Natural Heritage Research, Survey & Monitoring Report*****, No??**	Forbs always more than occasional	Yes - Favourable	X	X	X			X
		No - see report						
	Bryophytes always more than occasional	Yes - Favourable	X	X	X			X
		No - see report						
	If calcareous dune grasslands (SD7, SD8, SD9, SD19) are recorded in NVC survey, at least eight of the following present at more than occasional level:							
	Galium verum		A	A	A			
	Aira praecox							
	Arrhenatherum elatius (SD9 only)							
	Astragalus danicus							
	Luzula campestris				R			
	Carex arenaria							
	Carex flacca		R	O				
	Sedum acre							
	Plantago lanceolata		A	A	A			
	Trifolium repens		F	F	A			
	Lotus corniculatus		O	A	A			

	Thymus praecox		O	F	A			
	Cerastium fontanum							
	Prunella vulgaris		O	O	A			
	Pilosella officinarum		O	O				
	Veronica chamaedrys		A	F	F			
	Hypochoeris radicata			R				
	Festuca rubra		A	A	A			
	Ononis repens							
	Geranium molle							
	Erodium cicutarium							
	Euphrasia officinalis		R	R	O			
	Rhinanthus minor		R					
	Viola canina							
	Viola tricolor							
	Viola riviniana		F	O	F			
	Crepis capillaris							
	Odontites verna							
	Hypnum cupressiforme			R	O			
	Peltigera sp.			R	R			
	Cladonia sp.			R	R			
	Rhytidiadelphus squarrosus		A	F	A			
	Rhytidiadelphus triquetrus			R	O			
	Tortula muralis			R	R			
	Linum catharticum		O	F	O			
	At least eight of above present	Yes - favourable		X	X			X
		No – see report	X					
	If acidic dune grasslands (SD12) are recorded in NVC survey, at least six of the following present at more than rare level:							
	Galium saxatile							
	Carex arenaria							
	Carex pilulifera							
	Plantago lanceolata							
	Trifolium repens							
	Lotus corniculatus							
	Festuca ovina							
	Thymus praecox							
	Potentilla erecta							
	Luzula campestris							
	Pilosella officinarum							
	Hypochoeris radicata							
	Astragalus danicus							
	Deschampsia flexuosa							
	Cladonia spp.							
	Viola canina							
	Veronica chamaedrys							
	Aira praecox							
	Polygala serpyllifolia							
	Pleurozium schreberi							
	Scleropodium purum							

	Dicranum scoparium							
	Hylocomium splendens							
	At least six of the above present	Yes - Favourable						
		No - see report						
Vegetation composition: negative indicator species* Use DAFOR and/or target notes even for rare	*Arrhenatherum elatius* and/or *Dactylis glomerata* no more than occasional	Yes - Favourable						
		No - see report	X	X	X			X
	Chamaerion angustifolium patches never more than occasional	Yes - Favourable	X	X	X			X
		No - see report						
	Senecio jacobaea no more than frequent in sward	Yes - Favourable	X	X	X			X
		No - see report						
	Hippophae rhamnoides no more than 5% cover (fixed dune only)	Yes - Favourable	X	X	X			X
		No - see report						
	Other invasive species absent (includes *Cirsium arvense*, *Cirsium vulgare*, *Urtica dioica*, *Lolium perenne*) List and use DAFOR, target notes if present)	Yes - Favourable						
		No - see report	X	X	X			X
	Scrub (except *Juniperus communis*) never more than occasional as an invading component	Yes - Favourable	X	X	X			X
		No - see report						
	Tree invasion from adjacent plantations absent or rare	Yes - Favourable	X	X	X			X
		No - see report						
Other negative indicators* Use target notes	Sand or shingle extraction absent	Yes - Favourable	X	X	X			X
		No - see report						
	Improved or amenity grassland never more than rare	Yes - Favourable	X	X	X			X
		No - see report						
	Agricultural ploughing of fixed dunes Absent	Yes - Favourable	X	X				
		No - see report			X			X
	Vehicle damage absent	Yes - Favourable	X	X	X			X
		No - see report						
	Visitor damage (trampling, digging, jumping, fires, litter) absent	Yes – Favourable	X	X				X
		No - see report			X			
	Continuous lengths of bare sand paths >0.5 m wide absent	Yes - Favourable	X	X				X
		No - see report			X			
	Maintained paths (e.g. boardwalk) always in good condition (leave blank if absent)	Yes - Favourable						
		No - see report						
	Winter feeding impacts (poaching, patches of nitrophiles, spreads of straw and hay) never more than rare	Yes - Favourable	X	X				
		No - see report			X			X
	Stock grazing pressure and timing sufficient to allow flowering and fruiting of dune grassland species to at least frequent level	Yes - Favourable	X	X	X			X
		No - see report						
	Rabbit grazing pressure never sufficient to reduce flowering and fruiting of dune grassland species to occasional level	Yes - Favourable	X	X	X			X
		No - see report						
	List specific to site (note that rare vascular plants must be monitored separately, but mention where found if noted during coastal SCM) *Oxytropis halleri, Carex capillaris*	Yes - Favourable		X	X			X
		See report						
Indicators of								

local distinctiveness [* if notified for any of these]								

FEATURE OF INTEREST: DUNE SLACKS
(INCLUDES DUNE WET HEATH, MIRE AND SWAMP ON DUNES, PLUS TRANSITIONS FROM SALTMARSH) **Strathy Bay only (WALK 3)**

Attribute	Target	Condition choice	Transect and/or walk #					Decision for SSSI
			1		3 Strathy	4	5	
Extent*	No net loss in extent except as part of change to other dune habitats as part of natural processes (e.g. losses to bare sand, mobile dune, fixed dune or dry dune heath are all acceptable forms of loss as long as new areas of slack are continuing to be produced elsewhere)	Yes - Favourable			X			
		No - see report						
Physical structure: functionality [optional]	Natural conditions for initiating new slacks (blowout deflation to level of watertable, progradation) still occurring	Yes - Favourable			X			
		No - see report						
Vegetation structure: range of zones*	All dune slack communities should be present – from embryonic dune slacks with a high percentage of bare ground to those with more closed vegetation. Early dune slack successional stages at least occasional	Yes - Favourable			X			
		No - see report						
Vegetation structure: condition of *Salix repens* [* only if notified for this as SAC]	*Salix repens* at least frequent and 5-30cm tall	Yes - Favourable			N/A			
		No - see report						
Vegetation structure: patches [optional] Bare Ground?	Varied patch structure present and frequent if age of slack floor and floor microtopography allow (if in doubt leave blank)	Yes - Favourable			X			
		No - see report						
Vegetation structure: composition [optional section]	If SD14, SD15 or SD16 vegetation mapped in NVC survey, shrub cover (*Salix repens*) always more than frequent	Yes - Favourable			X			
		No - see report						
	Slack bryophytes always more than occasional (e.g. *Calliergon cuspidatum,*) *Campylium stellatum*	Yes - Favourable			X			
		No - see report						
Vegetation structure: composition* [mandatory section]	Combined cover of broad-leaved grasses (*Holcus* spp., *Dactylis glomerata*, *Arrhenatherum elatius*) <10% (do not complete for known SAC *Salix repens* section)	Yes – favourable			X			
		No – see report						
Separate target for forb grass ratio	For humid dune slacks, the sward should contain >30% cover of forbs and <70% grasses	Yes - Favourable			X			
		No - see report						
Vegetation composition target	Cover of *Salix repens* no greater than 33% % (do not complete for known SAC *Salix repens* areas)	Yes - Favourable			X			
		No - see report						
Target for scrub/trees?	If wet dune heath components (M15, M16) are recorded in NVC survey, at least one of the following present at more than Rare level:							
	Erica tetralix							
	Empetrum nigrum							
	Sphagnum spp.							
	At least one of above present	Yes - Favourable			n/a			

		No - see report						
	If other mire, tall-herb fen and swamp vegetation recorded in NVC survey, still present and in good condition	Yes - Favourable			X			
		No - see report						
Bryophytes occasional **Some of the species listed are bryophytes, and I think it is inappropriate to require identification of these to species**	For other vegetation (except SAC Category Dunes with *Salix repens*) at least four of the following at least frequent and an additional two occasional (use DAFOR]:							
	Salix repens				X			
	Mentha aquatica							
	Carex flacca				X			
	Carex arenaria				X			
	Ononis repens							
	Lotus corniculatus				X			
	Ranunculus flammula							
	Potentilla anserina				X			
	Hydrocotyle vulgaris							
	Calliergon cuspidatum				X			
	Galium palustre				X			
	Campylium stellatum							
	Equisetum variegatum							
	Prunella vulgaris				X			
	Anagallis tenella							
	Threshold achieved	Yes - Favourable			X			
		No - see report						
Vegetation structure: typical species (SAC dunes with *Salix repens* only – mandatory if present)	Two or more of the following at least frequent and two or more others at least occasional (use DAFOR):							
	Festuca rubra							
	Carex flacca							
	Carex arenaria							
	Ononis repens							
	Lotus corniculatus							
	Pilosella officinarum							
	Euphrasia officinalis							
	Threshold achieved	Yes - Favourable						
		No - see report						
Negative indicators: species*	Non-native species no more than rare. No more than one other negative indicator species more than frequent, or singly or together the cover of negative indicator species no more than 5%. Negative indicators include: *Senecio jacobaea*, *Cirsium arvense*, *Cirsium vulgare*, *Cirsium palustre, Urtica dioica*, *Lolium perenne*, *Arrhenatherum elatius*	Yes – Favourable			X			
		No – see report Use DAFOR						
Other negative indicators*	Sand or shingle extraction absent	Yes - Favourable			X			
		No - see report						
	Slack drainage on agricultural, military or golf course land absent	Yes - Favourable			X			
		No - see report						
	Vehicle damage absent	Yes - Favourable			X			
		Yes - see report						
	Continuous lengths of bare sand paths >0.5 m wide absent or never more than Rare – check slack edges	Yes - Favourable			X			
		No - see report						

	Maintained paths (e.g. boardwalk) always in good condition (leave blank if absent)	Yes - Favourable						
		No - see report						
	Areas with tall *Salix repens* and species-poor understorey never dominant or abundant	Yes - Favourable			X			
		No - see report						
	Tree invasion from adjacent plantations absent or rare	Yes - Favourable			X			
		No - see report						
	Scrub (except *Juniperus communis*) and trees never more than rare as invading component	Yes - Favourable			X			
		No - see report						
	Stock grazing pressure and timing sufficient to allow flowering and fruiting of dune slack species to at least frequent level	Yes - Favourable			X			
		No - see report						
	Winter feeding impacts (poaching, patches of nitrophiles, spreads of straw and hay) never more than rare	Yes - Favourable			X			
		No - see report						
	Rabbit grazing pressure never sufficient to reduce flowering and fruiting of dune slack species to occasional level	Yes - Favourable			X			
		No - see report						
	Slack pond excavation no more than small in extent and rare in frequency	Yes - Favourable			X			
		No - see report						
Indicators of local distinctiveness [* if notified for any of these]	List specific to site (note that rare vascular plants must be monitored separately, but mention where found if noted during coastal SCM) Gentianella amarella ssp	Yes - Favourable			X			
		See report						

FEATURE OF INTEREST: DRY DUNE HEATH – not present on this SSSI

Attribute	Target	Condition choice	Transect and/or walk #					Decision for SSSI
			1	2	3	4	5	
Extent*	No net loss in extent except as part of change to other dune habitats as part of natural processes (e.g. losses to bare sand, mobile dune, fixed dune or slack are all acceptable forms of loss - but see integrity/grazing below)	Yes - Favourable						
		No - see report						
Vegetation structure: range of zones*	Existing sequences from mobile dune (SD10), dune lichen heath (SD11) and dry dune heath (H11, occasionally H10), recorded in NVC surveys, maintained (interchange between the three types is allowable - a natural process)	Yes - Favourable						
		No - see report						
	Transition to terrestrial habitat(s) intact	Yes - Favourable						
		No - see report						
Vegetation structure: patches	Patch structure present and frequent, with varied dwarf shrub age structure (i.e. uniform old and senescent swards no more than occasional)	Yes - Favourable						
		No - see report						
	Small bare sand patches (<1 sq m) occasional to frequent	Yes - favourable						
	Small bare sand patches (<1 sq m) rare, abundant or dominant	See report						
Vegetation structure: composition*	Dwarf shrub cover (*Calluna vulgaris, Erica cinerea, Empetrum nigrum*) always more than frequent	Yes - Favourable						
		No - see report						
	Bryophytes always more than occasional	Yes - Favourable						
		No - see report						
	If dry dune heath components (SD10, SD11, H11 or H10) are recorded in NVC, at least four of the following present at more than rare level (use DAFOR):							
	Rumex acetosella							
	Carex arenaria							
	Festuca ovina							
	Cornicularia aculeata							
	Cladonia spp.							
	Ammophila arenaria							
	Aira praecox							
	Corynephorus canescens							
	Thymus praecox							
	Phleum arenarium							
	Erodium cicutarium							
	Logfia minima							
	Sedum acre							
	At least four of above present	Yes - Favourable						
		No - see report						
Negative indicators: species*	*Arrhenatherum elatius* and/or *Dactylis glomerata* no more than occasional	Yes - Favourable						
		No - see report						
	Chamaerion angustifolium patches never more than occasional	Yes - Favourable						
		No - see report						
	Senecio jacobaea no more than frequent in sward	Yes - Favourable						
		No - see report						

	Self-sown trees rare or absent	Yes - Favourable						
		No - see report						
	Improved or amenity grassland never more than rare	Yes - Favourable						
		No - see report						
	Invasive alien species absent	Yes - Favourable						
		No – see report						
Other negative indicators*	Stock grazing pressure and timing sufficient to allow flowering and fruiting of dune heath species to at least frequent level	Yes - Favourable						
		No - see report						
	Winter feeding impacts (poaching, patches of nitrophiles, spreads of straw and hay) never more than rare	Yes - Favourable						
		No - see report						
	Rabbit grazing pressure never sufficient to reduce flowering and fruiting of dry dune heath species to occasional level	Yes - Favourable						
		No - see report						
	Sediment extraction absent	Yes - Favourable						
		No - see report						
	Vehicle damage absent or rare	Yes - Favourable						
		No - see report						
	Visitor damage (trampling, digging, jumping, fires, litter) absent or only rare/occasional	Yes - Favourable						
		No - see report						
	Continuous lengths of bare sand paths >0.5 m wide absent or never more than rare	Yes - Favourable						
		No - see report						
	Maintained paths (e.g. boardwalk) always in good condition (leave blank if absent)	Yes - Favourable						
		No - see report						
	Recent dune restoration work (last 5 years) never more than rare	Yes - Favourable						
		No - see report						
	Scrub (except *Juniperus communis*) and trees never more than rare as an invading component	Yes - Favourable						
		No - see report						
	Tree invasion from adjacent plantations absent or rare	Yes - Favourable						
		No - see report						
	Stock grazing pressure and timing sufficient to allow flowering and fruiting of dune heath species to at least frequent level	Yes - Favourable						
		No - see report						
	Winter feeding impacts (poaching, patches of nitrophiles, spreads of straw and hay) never more than rare	Yes - Favourable						
		No - see report						
	Rabbit grazing pressure never sufficient to reduce flowering and fruiting of dry dune heath species to occasional level	Yes - Favourable						
		No - see report						
Indicators of local distinct-iveness [* if notified for any of these]	List specific to site (note that rare vascular plants must be monitored separately, but mention where found if noted during coastal SCM)	Yes - Favourable						