

# Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

---

**1. Name and address of the compiler of this form:****Joint Nature Conservation Committee**

Monkstone House  
City Road  
Peterborough  
Cambridgeshire PE1 1JY  
UK  
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948  
Email: [RIS@JNCC.gov.uk](mailto:RIS@JNCC.gov.uk)

FOR OFFICE USE ONLY.

DD MM YY

--	--	--

Designation date

--	--	--	--	--	--

Site Reference Number

---

**2. Date this sheet was completed/updated:**

Designated: 24 March 1997 / updated 12 May 2005

---

**3. Country:**

UK (Scotland)

---

**4. Name of the Ramsar site:**

Dornoch Firth and Loch Fleet

---

**5. Map of site included:**

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

**a) hard copy** (required for inclusion of site in the Ramsar List): yes  -or- no

**b) digital (electronic) format** (optional): Yes

---

**6. Geographical coordinates** (latitude/longitude):

57 51 00 N                      04 02 30 W

---

**7. General location:**

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Inverness

The site lies 40 km north-east of Inverness on the north-east coast of Scotland.

**Administrative region:** Highland

---

**8. Elevation** (average and/or max. & min.) (metres):    **9. Area** (hectares): 7836.6

Min.    -1  
Max.    10  
Mean    1

## 10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

A large area covering the two northernmost estuaries in the Moray Basin ecosystem. The Dornoch Firth is one of the best examples in north-west Europe of a large complex estuary which has been relatively unaffected by industrial development, whilst Loch Fleet is an example of a shallow, bar-built estuary. Extensive sandflats and mudflats are backed by saltmarsh and sand dunes with transitions to dune heath, grassland and alder *Alnus glutinosa* woodland. The tidal flats support internationally important numbers of waterfowl in winter and are the most northerly and substantial extent of intertidal habitat for wintering waterfowl in Britain, as well as Europe. The sand dune, saltmarsh and estuary habitats are of international importance for their flora and geomorphology.

---

## 11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

**1, 2, 5, 6**

**Secretariat comment: The RIS provides information requiring the application of Criterion 4. This needs to be included in the next update.**

---

## 12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

The site supports a variety of wetland features. Mound Alderwoods at the head of Loch Fleet is the largest estuarine alder *Alnus glutinosa* wood in Britain. The Dornoch Firth is a particularly good example of an east coast firth, little affected by industrial development. Morrich More is one of the most outstanding coastal dune sites in Britain. It is especially noteworthy for the development of an extensive low-level sandy plain on which a set of parabolic dunes are superimposed.

Ramsar criterion 2

The site supports nationally-scarce aquatic plants and British Red Data Book invertebrates. See section 19 and 20

Ramsar criterion 5

### Assemblages of international importance:

#### Species with peak counts in winter:

28692 waterfowl (5 year peak mean 1998/99-2002/2003)

See also section 20

#### Ramsar criterion 6 – species/populations occurring at levels of international importance.

#### Qualifying Species/populations (as identified at designation):

##### Species with peak counts in winter:

Greylag goose, *Anser anser anser*,

Iceland (br), UK/ Ireland (w)

2677 individuals, representing an average of 2.6% of the population (5 year peak mean for 1996/7-2000/01)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See [www.bto.org/survey/webs/webs-alerts-index.htm](http://www.bto.org/survey/webs/webs-alerts-index.htm). Details of bird species occurring at levels of National importance are given in Section 20

**13. Biogeography** (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) **biogeographic region:**  
Atlantic

b) **biogeographic regionalisation scheme** (include reference citation):  
Council Directive 92/43/EEC

**14. Physical features of the site:**

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	acidic, basic, shingle, sand, mud, alluvium, peat, nutrient-poor, sedimentary, sandstone
Geomorphology and landscape	lowland, coastal, valley, floodplain, crags/ledges, subtidal sediments (including sandbank/mudbank), intertidal sediments (including sandflat/mudflat), open coast (including bay), estuary, lagoon
Nutrient status	mesotrophic
pH	circumneutral
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Kinloss, 1971–2000) ( <a href="http://www.metoffice.com/climate/uk/averages/19712000/sites/kinloss.html">www.metoffice.com/climate/uk/averages/19712000/sites/kinloss.html</a> ) Max. daily temperature: 12.2° C Min. daily temperature: 5.1° C Days of air frost: 53.5 Rainfall: 624.4 mm Hrs. of sunshine: 1261.4

**General description of the Physical Features:**

The Dornoch Firth is one of the two northernmost estuaries in the Moray Basin system. It is one of the best examples in north-west Europe of a large complex estuary which has been relatively unaffected by industrial development, whilst Loch Fleet is an example of a shallow, bar-built estuary. Extensive sandflats and mudflats are backed by saltmarsh and sand dunes with transitions to dune heath and Alder *Alnus glutinosa* woodland.

**15. Physical features of the catchment area:**

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The Dornoch Firth is one of the two northernmost estuaries in the Moray Basin system. It is one of the best examples in north-west Europe of a large complex estuary which has been relatively unaffected by industrial development, whilst Loch Fleet is an example of a shallow, bar-built estuary. Extensive sandflats and mudflats are backed by saltmarsh and sand dunes with transitions to dune heath and Alder *Alnus glutinosa* woodland.

**16. Hydrological values:**

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Shoreline stabilisation and dissipation of erosive forces

**17. Wetland types**

Human-made wetland, Marine/coastal wetland

Code	Name	% Area
D	Rocky shores	0.6
E	Sand / shingle shores (including dune systems)	5.1
F	Estuarine waters	0.9
G	Tidal flats	80.9
H	Salt marshes	8.1
J	Coastal brackish / saline lagoons	0.3
M	Rivers / streams / creeks: permanent	0.2
O	Freshwater lakes: permanent	0.3
Tp	Freshwater marshes / pools: permanent	0.2
Ts	Freshwater marshes / pools: seasonal / intermittent	0.3
Xf	Freshwater, tree-dominated wetlands	3.1

**18. General ecological features:**

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

The Dornoch Firth and Loch Fleet contain extensive mud- and sandflats which support a rich marine invertebrate fauna and sizeable beds of *Zostera* and *Enteromorpha*. The tidal flats are bordered by foredunes and saltmarsh which grade into fixed dune, dune grassland and, dune heath further inland. The saltmarsh and brackish pools at Morrich More form the best example of this habitat in the north of Scotland. Dornoch Links and the Morrich More both have extensive examples of transitions from saltmarsh to dune and from fixed dune to dune heath. There is a very rare form of lichen heath on mixed sand and shingle at Cuthill Links with further areas of lichen-rich and moss-rich heath at Morrich More, Dornoch Links and Ferry Links.

Backing onto Loch Fleet are the Mound Alderwoods which form the largest estuarine alderwood in Great Britain. This was established when the inner part of Loch Fleet was enclosed from the sea by the building of the Mound embankment in 1816. Behind the embankment there is a transition from brackish lagoon, through saltmarsh to alderwood. The wetter areas support alder-swamp with areas of open fen. At Tarbat Ness the rocky shore is backed by species rich maritime heath and salt spray communities.

**19. Noteworthy flora:**

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

**Assemblage.**

The site is internationally important because it contains the following Habitats Directive Annex I features:

- H1110 Sandbanks which are slightly covered by sea water all the time
- H1130 Estuaries
- H1140 Mudflats and sandflats not covered by seawater at low tide
- H1310 *Salicornia* and other annuals colonising mud and sand
- H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- H2110 Embryonic shifting dunes

- H2120 Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”)  
 H2130 Fixed dunes with herbaceous vegetation (“grey dunes”)  
 H2140 Decalcified fixed dunes with *Empetrum nigrum*  
 H2150 Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)  
 H2190 Humid dune slacks  
 H2250 Coastal dunes with *Juniperus* spp.  
 H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*).

**Nationally important species occurring on the site.**

**Higher Plants.**

*Carex maritima*, *Centaureum littorale*, *Juncus balticus*, *Zostera angustifolia*, *Zostera noltei*.

**20. Noteworthy fauna:**

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.

**Birds**

**Species currently occurring at levels of national importance:**

**Species regularly supported during the breeding season:**

Osprey , *Pandion haliaetus*, Europe 13 individuals, representing an average of 10.2% of the GB population (2003)

**Species with peak counts in winter:**

Whooper swan , *Cygnus cygnus*, 81 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)  
 Iceland (br), UK/Ireland (w)  
 Eurasian teal , *Anas crecca*, 2175 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)  
 NW Europe  
 Common redshank , *Tringa totanus totanus*, 1265 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)

Bar-tailed godwit , <i>Limosa lapponica lapponica</i> , W Palearctic	1092 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9-2002/3)
--	---

**Species with peak counts in spring/autumn:**

Eurasian wigeon , *Anas penelope*, 14200 individuals, representing an average of 3.4% of the GB population (5 year peak mean 1998/9-2002/3)  
 NW Europe

**Species Information**

**Nationally important species occurring on the site.**

**Mammals.**

*Lutra lutra*, *Phoca vitulina* (Habitats Directive Annex II species)

**Invertebrates.**

*Callicera rufa*, *Grzegorzekia collaris*, *Dicanthous (Harminius) undulatus*, *Saldula opacula*.

**21. Social and cultural values:**

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

- Aesthetic
- Archaeological/historical site
- Environmental education/ interpretation

Fisheries production  
 Forestry production  
 Livestock grazing  
 Non-consumptive recreation  
 Scientific research  
 Sport fishing  
 Sport hunting  
 Tourism  
 Traditional cultural  
 Transportation/navigation

---

## 22. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
National/Crown Estate	+	+
Private	+	+

---

## 23. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Tourism	+	
Recreation	+	
Commercial forestry	+	
Fishing: commercial		+
Fishing: recreational/sport	+	
Freshwater aquaculture		+
Gathering of shellfish	+	
Bait collection	+	
Permanent arable agriculture		+
Rough or shifting grazing	+	
Hunting: recreational/sport	+	
Hydro-electricity/ water-power		+
Industry		+
Sewage treatment/disposal	+	
Harbour/port		+
Oil/gas production		+
Transport route	+	
Urban development		+
Non-urbanised settlements		+
Military activities	+	

---

**24. Factors adversely affecting the site's ecological character, including changes in land (including water) use and development projects:**

*Explanation of reporting category:*

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

*NA = Not Applicable because no factors have been reported.*

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
No factors reported	NA				

For category 2 factors only. What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Is the site subject to adverse ecological change? NO

**25. Conservation measures taken:**

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	+
National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	
Special Area of Conservation (SAC)	+	

**26. Conservation measures proposed but not yet implemented:**

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

**27. Current scientific research and facilities:**

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

**Contemporary.**

**Fauna.**

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl &

Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

A long-term bird-ringing study by Highland Ringing Group, part-funded by Scottish Natural Heritage, has targeted the commoner wading birds wintering in the Moray Basin, and more recently, Anser anser.

**Completed.**

**Environment, Flora and Fauna.**

A full baseline survey of the marine environment, flora and fauna of the Dornoch Firth was carried out in 1996.

**Flora.**

The sand dune and saltmarsh vegetation of the site has been surveyed to National Vegetation Classification (NVC) standard.

The effects of the pipeline fabrication facility on the plant communities of Morrich More are monitored on an annual basis.

**Fauna.**

Entomological records are detailed for parts of the site and less detailed for other parts.

---

**28. Current conservation education:**

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Some of the site is well provided with fixed interpretation panels at all the main public access points around the site.

The Scottish Wildlife Trust warden and Highland Council ranger service also lead guided walks in the less sensitive parts of the site, mainly during the summer months.

---

**29. Current recreation and tourism:**

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

**Activities, Facilities provided and Seasonality.**

Land-based recreation:

Walking, including dog walking, bathing and beach recreation is concentrated on the sandy beaches on the outer parts of the estuary and nearby areas such as Ferry Links and Dornoch Links. Birdwatchers tend to go where there is easy public access or the site can be viewed from the road. The golf course at Cuthill Links encroaches on part of the dune lichen heath. Mainly April to September.

Water based recreation:

Power boating, water-skiing, jet-skiing, wind-surfing, canoeing and angling are still relatively uncommon but are becoming more frequent as the participants become more local. Mainly April to September

Airborne recreation: Overflying by light aircraft and radio-controlled model aircraft causes a minor amount of disturbance to waterfowl in the vicinity of the Dornoch aerodrome. All year.

Wildfowling and hunting:

Game shooting in Mound Alderwoods. Wildfowling mainly controlled by private agreement with estates apart from Dornoch Firth where wildfowling is open to the public between Inver Bay and Edderton Sands.

Season: 1 September to 20 February inclusive.

There are caravan parks adjacent to the site at Dornoch and Meikle Ferry and several non-marina moorings throughout the site. There has been a proposal for a marina in recent years. Used mainly: April to Sept.

Between 10,000 and 20, 000 tourists are estimated to visit different parts of this large site annually.

---

**30. Jurisdiction:**

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Scottish Executive, Environment and Rural Affairs Department

---



**31. Management authority:**

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Scottish Natural Heritage, 2 Anderson Place, Edinburgh, EH6 5NP

**32. Bibliographical references:**

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 13 above), list full reference citation for the scheme.

**Site-relevant references**

- Barne, JH, Robson, CF, Kaznowska, SS, Doody, JP & Davidson, NC (eds.) (1996) *Coasts and Seas of the United Kingdom. Region 3. North-east Scotland: Cape Wrath to St Cyrus*. Joint Nature Conservation Committee, Peterborough (Coastal Directories Series)
- Batten, LA, Bibby, CJ, Clement, P, Elliot, GD & Porter, RF (1990) *Red Data Birds in Britain. Action for rare, threatened and important species*. Poyser, London, for Nature Conservancy Council and Royal Society for the Protection of Birds
- Bennett, TL & McLeod, CR (1998) Chapter 4. East Scotland (Duncansby Head to Dunbar) (MNCR Sector 4). In: *Benthic marine ecosystems of Great Britain and the north-east Atlantic*, ed. by K. Hiscock, 123-154. Joint Nature Conservation Committee, Peterborough. (Coasts and Seas of the United Kingdom. MNCR series)
- Buck, AL (ed.) (1993) *An inventory of UK estuaries. Volume 4. North and east Scotland*. Joint Nature Conservation Committee, Peterborough
- Burd, F (1989) *The saltmarsh survey of Great Britain. An inventory of British saltmarshes*. Nature Conservancy Council, Peterborough (Research & Survey in Nature Conservation, No. 17)
- Church, JM, Coppins, BJ, Gilbert, OL, James, PW & Stewart NF (eds.) (1996) *Red Data Books of Britain and Ireland: lichens. Volume 1: Britain*. Joint Nature Conservation Committee, Peterborough
- Cohen, S (1997) *Tarbat Ness Site of Special Scientific Interest, 5 Year Management Statement. 1997/8–2001/2*. Scottish Natural Heritage, Dingwall
- Covey, R, Fortune, F, Nichols, DM & Thorpe, K (1998) *Marine Nature Conservation Review Sectors 3, 4, 13 & 15. Lagoons in mainland Scotland and the Inner Hebrides: area summaries*. Joint Nature Conservation Committee, Peterborough (Coasts and seas of the United Kingdom. MNCR series)
- Cranswick, PA, Waters, RJ, Musgrove, AJ & Pollitt, MS (1997) *The Wetland Bird Survey 1995–96: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge
- Dargie, TCD (1988) *Morrich More S.S.S.I. Vegetation Survey 1988*. Nature Conservancy Council, Peterborough
- Dargie, TCD (1994) *Sand Dune Vegetation Survey of Scotland: Dornoch (Meikle Ferry to Embo Pier)*. Draft Report. Scottish Natural Heritage, Edinburgh
- Dean, BJ, Webb, A, McSorley, CA & Reid, JB (2003) Aerial surveys of UK inshore areas for wintering seaduck, divers and grebes: 2000/01 and 2001/02. *JNCC Report*, No. 333. [www.jncc.gov.uk/page-2346](http://www.jncc.gov.uk/page-2346)
- Dean, BJ, Webb, A, McSorley, CA & Reid, JB (2004) Surveillance of wintering seaduck, divers and grebes in UK inshore areas: aerial surveys 2002/03. *JNCC Report*, No. 345
- Dean, BJ, Webb, A, McSorley, CA, Schofield, RA & Reid, JB (2004) Surveillance of wintering seaducks, divers and grebes in UK inshore areas: aerial surveys and shore-based counts 2003/04. *JNCC Report*, No. 357
- Doody, JP, Johnston, C & Smith, B (1993) *Directory of the North Sea coastal margin*. Joint Nature Conservation Committee, Peterborough
- Gubbay, S (1988). *A Coastal Directory for Marine Nature Conservation*. Marine Conservation Society, Ross-on-Wye
- Harding-Hill, R (1993) *The Moray Firth review*. Scottish Natural Heritage, North-West Region, Inverness
- Joint Nature Conservation Committee (1996) *Guidelines for selection of biological SSSIs*. Joint Nature Conservation Committee, Peterborough. [www.jncc.gov.uk/Publications/sssi/default.htm](http://www.jncc.gov.uk/Publications/sssi/default.htm)
- May, VJ & Hansom, JD (eds.) (2003) *Coastal geomorphology of Great Britain*. Joint Nature Conservation Committee, Peterborough (Geological Conservation Review Series, No. 28)
- McLeod, CR, Yeo, M, Brown, AE, Burn, AJ, Hopkins, JJ & Way, SF (eds.) (2004) *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Joint Nature Conservation Committee, Peterborough. [www.jncc.gov.uk/SACselection](http://www.jncc.gov.uk/SACselection)
- Musgrove, AJ, Pollitt, MS, Hall, C, Hearn, RD, Holloway, SJ, Marshall, PE, Robinson, JA & Cranswick, PA (2001) *The Wetland Bird Survey 1999–2000: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge. [www.wwt.org.uk/publications/default.asp?PubID=14](http://www.wwt.org.uk/publications/default.asp?PubID=14)
- Omand, D (1982) *The Sutherland book*. Northern Times, Golspie
- Ralph, R (ed.) (1986) *The marine environment of the Moray Firth. Proceedings of the Royal Society of Edinburgh. Series B: Biological Sciences*, 91

- Ramsay, DL & Brampton, AH (2000) Coastal cells in Scotland: Cell 3 – Cairnbulg Point to Duncansby Head. *Scottish Natural Heritage Research Survey and Monitoring Report*, No. 145
- Ratcliffe, DA (ed.) (1977) *A Nature Conservation Review. The selection of biological sites of national importance to nature conservation in Britain*. Cambridge University Press (for the Natural Environment Research Council and the Nature Conservancy Council), Cambridge (2 vols.)
- Scottish Natural Heritage (nd) *Dornoch Firth and Morrich More. 'Shifting sands and swirling flocks'*. Scottish Natural Heritage, Dingwall (leaflet)
- Shirt, DB (ed.) (1987) *British Red Data Books: 2. Insects*. Nature Conservancy Council, Peterborough
- Stewart, NF (2004) *Important stonewort areas. An assessment of the best areas for stoneworts in the United Kingdom*. Plantlife International, Salisbury
- Stroud, DA, Chambers, D, Cook, S, Buxton, N, Fraser, B, Clement, P, Lewis, P, McLean, I, Baker, H & Whitehead, S (eds.) (2001) *The UK SPA network: its scope and content*. Joint Nature Conservation Committee, Peterborough (3 vols.) [www.jncc.gov.uk/UKSPA/default.htm](http://www.jncc.gov.uk/UKSPA/default.htm)
- Symonds, FL & Cohen, S (1997) *Dornoch Firth Site of Special Scientific Interest, 5 year Management Statement. 1997/8–2001/2*. In prep. Scottish Natural Heritage, Golspie
- Symonds, FL (1996) *Mound Alderwoods National Nature Reserve, 5 year Management Plan 1996/7–2000/1*. Unpublished. Scottish Natural Heritage, Golspie
- Symonds, FL (1997). *Loch Fleet Site of Special Scientific Interest, 5 year Management Statement. 1997/8–2001/2*. Unpublished. Scottish Natural Heritage, Golspie
- Waters, JR & Cranswick, PA (1993) *The Wetland Bird Survey 1992-1993. Wildfowl and wader counts. BTO/WWT/RSPB/JNCC, Slimbridge*
- Wortham, P (1997). *Morrich More Site of Special Scientific Interest, 5 year Management Statement. 1997/8–2001/2*. Unpublished. Scottish Natural Heritage, Dingwall

---

Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**  
Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • email: [ramsar@ramsar.org](mailto:ramsar@ramsar.org)