

Information Sheet on Ramsar Wetlands (RIS) – 2009-2012 version

Available for download from http://www.ramsar.org/ris/key_ris_index.htm.

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th Conference of the Contracting Parties (2005).

Notes 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. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

Miljøfaglig Utredning AS commissioned by Norwegian
Directorate for Nature Management, Tungasletta 2, 7485
Trondheim
Tlf +47 73580500
Fax: +47 73580501
E-mail: postmottak@dirnat.no

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

March 2012

October 2010

3. Country:

Norway

4. Name of the Ramsar site:

Nordre Tyrifjorden Wetlands System: Synneren
(International No. 802, National No. 15)

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site ; or
b) Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged:

or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ; or
- i) the boundary has been extended ; or
- iii) the boundary has been restricted**

and/or

If the site area has changed:

- i) the area has been measured more accurately ; or
- ii) the area has been extended ; or
- iii) the area has been reduced**

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

None

7. Map of site:

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

a) A map of the site, with clearly delineated boundaries, is included as:

- i) a **hard copy** (required for inclusion of site in the Ramsar List): ;
- ii) an **electronic format** (e.g. a JPEG or ArcView image) ;
- iii) a **GIS file providing geo-referenced site boundary vectors and attribute tables** ;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The boundary is the same as for Synneren Nature Reserve.

8. Geographical coordinates (latitude/longitude):

60° 07'N 10° 12'E

9. General location:

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

The site is 5 km south of Hønefoss and about 40 km north-west of Oslo, in Ringerike municipality in the county of Buskerud in south-east Norway.

10. Elevation: (average and/or max. & min.)

63 m.a.s.l.

11. Area: (in hectares)

50 ha

12. General overview of the site:

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

Synneren is the youngest of three oxbow lakes along the Storelva river, with a large area of open water. Sedges and horsetails grow along the water's edge, and with surrounding areas of *Salix cinerea* scrub and

Alnus incana woods. Synneren is connected to Storelva by a narrow channel running out from the south-west end, and water levels are influenced by water transport from Storelva and water levels in Tyrifjorden. In spring and autumn mudbanks may be exposed, depending upon the amount of snow melt and precipitation.

Together with the other protected sites in the delta system of Nordre Tyrifjorden, as well as other proposed sites within the wetland system, the area is important as a nesting site for waterbirds, and as a staging site for wetland birds during spring and autumn, in particular for Whooper Swan *Cygnus cygnus*. Following ice melt in spring and until the area freezes again in autumn, there may be several hundred ducks in the reserve. Several regionally rare and unusual species nest or have nested in the reserve.

A number of rare and red-listed species of plants and fungi (associated with woodland) have been found in the reserve. Rich freshwater shore vegetation (which is seriously threatened in Norway) is still found in the area, although the amount of this vegetational type has severely declined during recent decades due to succession, over-fertilising and invasion by Canadian pondweed *Elodea canadensis*.

13. 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 • 3 • 4 • 5 • 6 • 7 • 8 • 9

14. Justification for the application of each Criterion listed in 13. 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).

- Criterion 1. Part of the delta area around the mouth of the Storelva river, one of Norway's largest inland deltas and with an interesting geomorphology. The delta landscape comprises slow-flowing meandering river, oxbow lakes in various stages of succession, channels and drift walls along the Tyrifjord. Oxbow lakes such as at Synneren are an unusual element in the delta.
- Criterion 2. No red-listed species are confirmed as having bred in the reserve, although Spotted Crake *Porzana porzana* (EN) probably breeds. Hobby *Falco subbuteo* (VU) hunt in the area during the breeding season. The area is however of more important as a staging site for nationally or internationally threatened species Smew *Mergellus albellus* (VU), Hen Harrier *Circus cyaneus* (VU). In addition the reserve supports several red-listed plant species associated with boggy areas, meadows at the edge of freshwater and shallow waters. The Norwegian Red List 2010 is used. See also pt. 21 and 22.
- Criterion 3. Undeveloped inland deltas have become less common due to in-filling in connection with industry and such like. Therefore it is important to look after the remaining examples of this type, and thus protect the regional biodiversity. The Nordre Tyrifjorden wetland system has a well developed annual vegetation on exposed banks (*Nanocyperetalia*) and submerged meadows which are typical for river deltas below the marine limit in southern Norway, as well as bog and rich fen vegetation associated with oxbow lakes under succession. These vegetation communities contain a number of rare and threatened species which are in need of protection together with their habitats. The wetland fauna in Nordre Tyrifjorden includes both rare species as well as species which are typical or representative for the biogeographical region.
- Criterion 4 The area is important as a nesting site for waterbirds, and as a staging site for wetland birds during spring and autumn, in particular for Whooper Swan *Cygnus cygnus*. Following ice melt in spring and until the area freezes again in autumn, there may be several hundred ducks in the reserve. Several regionally rare and unusual species nest or have nested in the reserve. See also point 22.

15. 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:

- 1 - Boreonemoral vegetation zone, transitional zone (Bn-OC).
- 2 - Boreal

b) biogeographic regionalisation scheme (include reference citation):

- 1 - Zonal division showing the variation in vegetation from south to north and from the lowlands to the mountains, and sectional graduation showing the variation between the coast and inland (In: Moen, A. 1998. Nasjonalatlas for Norge; vegetasjon. Statens kartverk, Hønefoss).
- 2 - Biogeographical regions of Europe, European Environment Agency, 2005

16. 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.

Geology	A geological boundary runs along the Storelva river, with nutrient-rich cambrosilurian bedrocks on the east side, and Precambrian basement rocks on the west side where Synneren is situated. Storelva has dug it's way into the impressive ice-edge deposits with sand and exposed marine deposits of clay.
Geomorphology	The delta by the mouth of the Storelva river is rich in various components. There are active river meanders, oxbow lakes, river terraces, terrace edges, old river courses, flood channels and freshwater drift walls along the stretch between Karlsrudtangen to Averøy in Nordfjorden. Of special interest are the oxbow lakes such as that at Synneren. The rising land surface after the last ice age has led to river meanders becoming cut off from Storelva.
Substrate / Soil type	The loose material at Synneren is almost entirely composed of fine-grained marine deposits i.e. silt and clay. Along the waterside meadows there is some organic material and peaty soils.
Water quality	The water quality at Synneren is unknown. The water is probably better than at Juveren in relation to nutrient salts and intestinal bacteria. Synneren has a different chemistry to Juveren, which is calcerous.
Water depth / fluctuations	Water depth within the nature reserve is between 0 – 2 m. Large areas of mud are exposed when water levels in Tyrifjorden are low. The watercourse has a regulation regime of 1 m, and water levels are lowest in spring. During periods with little precipitation in summer a number of mudbanks may be exposed in late summer/autumn.
Climate	The area has a slightly continental climate, with relatively warm summers and cold winters and moderate annual precipitation (500-700 mm).

17. 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).

Synneren has a limited catchment area which includes only the surrounding farmland and woodland close to the oxbow lake. The area is affected by ecological processes in the nearby river Storelva (see under section on Nordre Tyrifjorden). The catchment area for Synneren comprises the clay soil plains around the water and part of Prestmoen – an impressive ice-edge deposit (mainly composed of sand) north-east of the reserve. The climate within the catchment area is as that of the reserve (se point 14).

18. Hydrological values:

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

Synneren has a function as a local sediment trap and as an area where nutrients become bound to the sediments. Outside periods of flooding water only runs off from the nearby agricultural land.

19. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • Q • P • Q • R • Sp • Ss • Tp • Ts • U • Va •
Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

O, Xf, Tp

20. General ecological features:

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

Synneren is a shallow permanent oxbow lake, which still has large areas of open water. The shore is characterised by large populations of *Equisetum fluviatile* along belts of sedge *Carex* and *Salix cinerea* scrub, and these areas flood regularly. The mudbanks formerly had well developed annual vegetation on exposed banks (*Nanocyperetalia*), although there are now only fragments remaining due to overgrowing. The areas of open water are dominated by aquatic vegetation such as Canadian pondweed *Elodea canadensis* and pondweeds *Potamogeton*. The invertebrate fauna is insufficiently known. Synneren is considered as having an interesting limnology. There are few species of fish, the most common being Pike *Esox lucius*, Bream *Abramis brama* and Crucian Carp *Carassius carassius*.

21. 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.*

Before protection, Synneren had interesting vegetation on the mudbanks, boggy areas and in the water itself, although these areas have become fragmented due to overgrowing and over-fertilisation. Even so, there are still several nationally and regionally threatened species associated with rich shore vegetation such as *Crassula aquatica*, *Elatine triandra* (NT) and *Elatine hydropiper*. Nationally Red-listed fungi found include *Climacodon septentrionalis* (NT)

22. 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.*

Synneren is mainly important as a staging site during spring and autumn migration, and the area supports nationally important numbers of Whooper Swan *Cygnus cygnus* (about 200 recorded in spring). Several other red-listed species occur, although in small numbers. These include Northern Pintail *Anas acuta*, Smew *Mergellus albellus* (VU) and Hen Harrier *Circus cyaneus* (VU). In addition a few regionally scarce species nest such as Common Coot *Fulica atra* (2-3 pairs) and Garganey *Anas querquedula* (only recorded in one season) and also Mute Swan *Cygnus olor* (2-3 pairs). Spotted Crake *Porzana porzana*, Moorhen *Gallinula chloropus* and Lesser Spotted Woodpecker *Dendrocopos minor* probably nest in the area in some years. Several pairs of Osprey *Pandion haliaetus* hunt in the area (these nest on nearby slopes) as well as Hobby *Falco subbuteo* (VU) and Marsh Harrier *Circus aeruginosus* (VU) which are occasional during the breeding season.

23. Social and cultural values:

a) Describe if the site has any general social and/or 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:

There is some birdwatching in the area, otherwise there are no other social or cultural activities.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

If Yes, tick the box and describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

- (a) within the Ramsar site: Private
- (b) in the surrounding area: Private

25. Current land (including water) use:

(a) within the Ramsar site:
Some water is extracted from the reserve to irrigate farmland.

(b) in the surroundings/catchment:
Both Tyrifjorden and Storelva are regulated to provide hydroelectricity, and this affects water levels in the oxbow lakes. The reserve is surrounded by intensive farming. Hønefoss, with about 13500 residents, is about 5 km north of the reserve. The rivers Randselva and Begna meet at Hønefoss, and then form Storelva. Further up this watercourse are several smaller settlements.

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

(a) within the Ramsar site:

Regulation of the Begna watercourse/Storelva affects water levels and the geomorphological processes in the Storelva river, especially at Averøya and Karlsrudtangen. As the regulation results in less flooding than the natural processes within the delta are subdued.

The meadows beside the freshwater by Synneren were formerly used for cattle grazing, and overgrowing during the past 20-30 years has reduced the biodiversity of the area. Eutrophication has also accelerated this process.

Canadian pondweed *Elodea canadensis* is a North American water plant which was imported to Europe around 1836. It was first recorded in Tyrifjorden in 1976. The species soon out-competed several aquatic plants in Juveren and Synneren. Together with over-fertilisation and cessation of grazing by livestock, Canadian pondweed has led to overgrowing of areas of mudbanks where threatened species associated with rich shore vegetation occurred earlier.

(b) in the surrounding area:

In recent years changes in farming practices, treatment of run-off from farming, and treatment of domestic waste water has led to a reduction in plant nutrients. Over-fertilisation of Synneren, which was a greater problem 10-20 years ago, has been reduced, with positive effects on the site's ecology and biological production.

27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

The area was designated as a nature reserve on 28th June 1985.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented?:

The management authorities have approved a management plan for the reserve, and practices within the plan are being carried out on a continual basis. The management plan will be revised in connection with the ongoing process to expand the Ramsar sites in Tyrifjorden.

d) Describe any other current management practices:

28. Conservation measures proposed but not yet implemented:

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

The Norwegian Ornithological Society (NOF) has proposed that other sites within the Nordre Tyrifjorden wetland system receive protection, such as the lower reaches of Storelva and Nordfjorden in order to create a larger continuous protected area. In addition NOF also propose that protection be offered several other shallow wetlands and areas further east in Tyrifjorden, in Steinsfjorden and along Randelava and Begna.

29. Current scientific research and facilities:

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

The Hole and Ringerike branch of the Norwegian Ornithological Society (NOF) carry out annual monitoring of breeding and wintering waterbirds in Nordre Tyrifjorden, as well as recording of passage movements of Pink-footed Geese *Anser brachyrhynbus* and Great Cormorants *Phalacrocorax carbo*.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

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

The local game management association (Ringerike Viltnemnd) have produced a booklet about Nordre Tyrifjorden, which includes a section on Juveren nature reserve.

31. Current recreation and tourism:

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

The area is a popular for birdwatching, and each spring local ornithologists organise an annual trip for members of the general public. Fishing from boats also occurs within the reserve.

32. Jurisdiction:

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

Norwegian Directorate for Nature Management (DN), Tungasletta 2, 7485 Trondheim

Ph +47 73580500

Fax +47 73580501

Email: postmottak@dirnat.no

33. 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.

The site is managed by the County Governor of Buskerud, which is under the instruction of DN.
Address: County Governor of Buskerud, Statens Hus, Postboks 1604, 3007 Drammen, Norway. Phone +47 32266600. E-mail: postmottak@fmbu.no

34. Bibliographical references:

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

Kålås, J.A., Viken, Å., Henriksen, S. and Skjelseth, S. (eds.). 2010. The 2010 Norwegian Red-list for Species. Norwegian Biodiversity Information centre, Norway.

Botanical and management plans:

Brandrud, T. E. 1998. Biologisk mangfold i verneområder på Ringerike: Vann- og sumpvegetasjon, samt soppflora i tilknytning til kroksjøer langs Storelva og deltaet i Nordre Tyrifjorden. *NIVA Rapport* Lnr. 3856-98: 1-44. (In Norwegian with English abstract – on water- and swamp vegetation and funga in oxbow lakes and the delta in Nordre Tyrifjorden)

Fylkesmannen i Buskerud, Miljøvernavdelingen 1999. Synneren naturreservat i Ringerike kommune. Forvaltningsplan. *Fylkesmannen i Buskerud, Miljøvernavdelingen Rapport* nr. 11-1999. 70 s. (In Norwegian – management plan for Synneren nature reserve)

Hanssen, E. W. 1999. *Vurdering av våtmarksområder i Nordre Tyrifjorden med Storelva og Begna. Deres betydning for biologisk mangfold - spesielt våtmarksfugler - og andre naturverdier*. Oppdragsrapport for Fylkesmannen i

Buskerud, Miljøvernveddelingen. 61 s. (In Norwegian – on biodiversity (especially wetland birds) in Nordre Tyrifjord area).

Freshwater ecology / fish / invertebrates:

Elgmork, K. (red.) 1969. Verneverdige områder på Ringerike av interesse for naturvitenskapelig forskning og undervisning. Avgrensning og verneverdi. Univeristetet i Oslo. 41 s. (In Norwegian – on areas of conservation value in Ringerike municipality of interest for research and education).

Gundersen, L. 1967. Juveren og Synneren. En limnologisk undersøkelse med spesiell vekt på de hydrografiske forhold. Hovedfagsoppgave i limnologi, Univ. i Oslo. (In Norwegian – on limnological studies in Juveren and Synneren).

Birds:

Ree, V. 1995a. Nordre Tyrifjorden-området i Buskerud - en av Norges viktigste innlandslokaliteter for våtmarksfugl. Vår Fuglefauna 18: 15-19. (In Norwegian – on the importance of the Nordre Tyrifjorden Wetland system for waterbirds)

Ree, V. 1995b. Fuglelivet i og ved Nordre Tyrifjorden. En presentasjon av reservater og nærliggende våtmarker i ornitologisk sammenheng. Ringerike Viltneemd, Hønefoss. (In Norwegian – a presentation of bird life in the reserves of Nordre Tyrifjord and their surroundings).

Geomorphology:

Erikstad, L., Reitan, O., Stabbetorp, O. og Ytrehorn, O. 1999. Ringeriksbanen - en landskapsøkologisk analyse av konsekvensene for ulike traséer gjennom Hole og Ringerike kommuner. NINA

Oppdragsmelding 606: 1-44. (In Norwegian with English abstract – on landscape and delta processes). Trondsen, T. I. 1983. Storelvas terrasse og meanderlandskap. Dannelse og utvikling av kroksjøer mellom Hønefoss og Tyrifjorden. Sammendrag av hovedfagsoppgave, Univ. i Oslo. 15 s. (In Norwegian – on formation of oxbow lakes between Hønefoss and Tyrifjorden).