

Information Sheet on Ramsar Wetlands

Categories approved by Recommendation 4.7 of the Conference of the Contracting Parties.

NOTE: It is important that you read the accompanying *Explanatory Note and Guidelines* document before completing this form.

1. Date this sheet was completed/updated:

April 2002

FOR OFFICE USE ONLY.

DD	MM	YY

Designation date

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Site Reference Number

2. Country:

Sweden

3. Name of wetland:

Hornborgasjön (lake)

4. Geographical coordinates:

58° 19' N, 013° 33' E

5. Altitude: (average and/or max. & min.)

119 - 125 m

6. Area: (in hectares)

6 510 ha

7. Overview: (general summary, in two or three sentences, of the wetland's principal characteristics)

One of the most famous and largest bird-lakes in Sweden, well-known for resting and displaying cranes. The lake is shallow, with a mixture of open water and submerged vegetation, reed-beds, wet woodland and wet meadows and the site includes the main feeder stream.

8. Wetland Type (please circle the applicable codes for wetland types as listed in Annex I of the *Explanatory Note and Guidelines* document.)

marine-coastal: A . B . C . D . E . F . G . H . I . J . K

inland: L . M . N . Q . P . Q . R . Sp . Ss . Tp . Ts
. U . Va . Vt . W . Xf . Xp . Y . Zg . Zk

man-made: 1 . 2 . 3 . 4 . 5 . 6 . 7 . 8 . 9

Please now rank these wetland types by listing them from the most to the least dominant: O, Tp, W, 4, Xf, M

9. Ramsar Criteria: (please circle the applicable criteria; see point 12, next page.)

1 . 2 . 3 . 4 . 5 . 6 . 7 . 8

Please specify the most significant criterion applicable to the site: 5

10. Map of site included? Please tick *yes* -or- *no*

(Please refer to the *Explanatory Note and Guidelines* document for information regarding desirable map traits).

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

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Please provide additional information on each of the following categories by attaching extra pages (please limit extra pages to no more than 10):

12. Justification of the criteria selected under point 9, on previous page. (Please refer to Annex II in the *Explanatory Note and Guidelines* document).

2. 1 globally redlisted bird species, >50 nationally redlisted species, including >10 bird and 5 plant species
 3. Support particular elements of biological diversity that are characteristic of the EU Boreal region
 4. A moulting site for large numbers of waterbirds
 5. >20 000 waterbirds, including 16 000 *Fulica atra*, 10 000 ducks, 20 000 gulls, 10 000 cranes.
 6. Supports about 15% of the north-west European population of *Grus grus*
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13. General location: (include the nearest large town and its administrative region)

20 km north of Falköping in south-western Sweden. Municipalities: Falköping, Skara, Skövde.

14. Physical features: (e.g. geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth water permanence; fluctuations in water level; tidal variations; catchment area; downstream area; climate)

Hornborgasjön is a large post-glacial lake, some 10 000 years old. The undermost rock consists of sandstone and is covered among other by limestone. The limestone has eroded, resulting in a three metre thick layer of lime deposit in the northern basin of the lake.

The climate is typically continental with moderate temperature range between summer and winter. Average air temperature is in winter -2.8°C (mean December-February 1960-1990). The lake is covered with ice between the first of December and the first of April.

The current hydrological regime allows for spring flooding as well as low water situations during summer and winter. The maximum seasonal fluctuation of approximately 1.7 m, but the average amplitude during a year is just below 1.0 m. The mean deep during average water level is 0.8 m and the deepest part is 1.6 m. The catchment area is 620 km².

The lake is nutrient-rich, depending on high concentrations of phosphorus and nitrogen in in-flowing water. Most of the catchment area consists of farmland, which is leaking nutrients to the streams. Nitrogen concentration is about 2.0-4.0 mg/l and phosphorus 0.02-0.03 mg/l. The concentration of calcium is high in in-flowing water, resulting in pH values around 8.0 during summer. High concentrations of conductivity and alkalinity also occur in the lake.

15. Hydrological values: (groundwater recharge, flood control, sediment trapping, shoreline stabilisation etc)

The lake also plays an important role for sediment trapping and purification of nutrients. The inflow of nitrogen is on average (1992-2000) 530 ton per year and in out-flowing water the corresponding figure is 290 ton, resulting in a retention rate of about 45%. But changes in purification occur between different year depending on the amount of precipitation in the area. The restored water regime has a more even water outflow and the new situation prevent high and very low peaks in out-flowing water, which favours the hydrological electric power and reduces farmland flooding downstream the lake.

16. Ecological features: (main habitats and vegetation types)

Shallow, open water dominates the area together with emergent vegetation, mostly reed *Phragmites australis*. About 80 % of open water is covered by submerged vegetation, where *Chara*- and *Potamogeton*- species dominate. But changes occur from year to year depending on the water levels. Within the reed-beds, some shrub vegetation still grows in the southern part, despite the raise of water level. To the south and east, some larger areas is dominated by *Carex acuta*. The wet meadows occur in the south and east part of the lake, where the grasses such as *Deschampsia caespitosa* and *Alopecurus*

geniculatus dominate. Large areas containing *Bidens* vegetation can also be found here. In restricted areas around the shoreline there are some wet forest left. Some small, calcareous areas occur on the wet meadows in north.

17. Noteworthy flora: (indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc)

Totally nine *Chara* species have been found in the lake, among them nationally redlisted species such as *Chara rudis*, *C. vulgaris* and *C. hispida*. Thirteen species of *Potamogeton* species occur, including the rare species *Potamogeton friesii* and *P. rutilus* (both nationally redlisted). Orchids such as *Epipactis palustris* and *Dactylorhiza incarnata* grow on calcareous ground.

18. Noteworthy fauna: (indicating, e.g., which species are unique, rare, endangered, abundant or biogeographically important; include count data, etc.)

The lake is famous as a stopover site for cranes *Grus grus* in the migration period, spring and autumn. The first cranes arrive to the area in the beginning of March. As many as 10 000 cranes can be seen on one day in April. In autumn the corresponding figure is 7 500 cranes, in late September-October. The conditions for resting waterfowl have improved dramatically since the restoration concluded in mid-1990's. In autumn more than 10 000 ducks of different species and 16 000 coots *Fulica atra* have been counted. Many migrating waders, especially *Tringa* species, such as the ruff *Philomachus pugnax* and snipe *Gallinago gallinago* have also been favoured.

The nature reserve also support about 50 species of breeding wetland birds including all five European *Podicipedidae* species. Redlisted species include the only remaining Swedish breeding colony of black-necked grebe *Podiceps nigricollis* (105 pairs 2000, nationally redlisted), the black tern *Chlidonias niger* (55 pairs in 2001, nationally redlisted, EU Birds directive species) and also dunlin *Calidris alpina schinzii* (a few pairs, nationally redlisted). Despite a reduction of reed-bed linked to the restoration measures, this habitat support an increased number of bittern *Botaurus stellaris* (10 males, nationally redlisted, EU Birds directive species), and great reed warbler *Acrocephalus arundinaceus* (100 males, nationally redlisted). Also dabbling ducks such as the shoveler *Anas clypeata* (nationally redlisted), garganey *A. querquedula* (nationally redlisted) and gadwall *A. strepera* (nationally redlisted), all closely associated to wet meadows, have increased in breeding numbers. In the main river the kingfisher *Alcedo atthis* (nationally redlisted, EU Birds directive species)

Additional information can be found in Annex 1.

19. Social and cultural values: (e.g. fisheries production, forestry, religious importance, archaeological site etc.)

Findings from the ancient shoreline suggest that the lake area supported human civilisations as early as 10 000 years ago. A lot of evidence is found in passage graves, stone cista, megalithic tombs and other artefacts from that time. Early humans by the lake were hunters that lived a mobile life. Gradually, humans became domiciled and started farming practices in the Hornborga valley. Just prior to the first drainage projects in the 1900th century, the lake played an important role for people living around the lake, using it for fishing and hunting as well as for food supply for domestic cattle in winter and reed for building material. Today the area has an important role for recreation activities such as bird-watching, angling, hunting and walking.

20. Land tenure/ownership of: (a) site (b) surrounding area

(a) 2700 ha is owned by the Swedish Environmental Protection Agency (SEPA), the remaining parts by private persons.

(b) Private owners

21. Current land use: (a) site (b) surroundings/catchment

(a) Agriculture

(b) Agriculture and forestry

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects: (a) at the site (b) around the site

(a) Previous lowering of the lake level by nearly 2.0 m between 1805-1935. Restoration of the lake in 1992-95 including a rise in water level by 0.85 m.

(b) None known

23. Conservation measures taken: (national category and legal status of protected areas - including any boundary changes which have been made: management practices; whether an officially approved management plan exists and whether it has been implemented)

Repeated agricultural drainage projects between 1805 and 1935 lowered the lake water level and reduced the extent of wet areas around the lake. By mid 1960's, little open water remained. As a result of increasing conservation awareness, the government commissioned the Swedish EPA to explore the possibilities to secure the lake Hornborga as a bird-lake for future. The restoration plan was presented in mid-1980's. The restoration measures included the construction of a 3 km long retaining dam and an outflow sluice, which allowed a rise of the water level. Approximately 500 ha of forest and shrubs were cut and almost 1200 ha of reed were burnt and/or chopped, using specially designed amphibious machinery. Following the new water regime, about 800 ha of former arable land have been transformed into wet meadows, currently mainly managed by grazing or used for hay production.

In 1999 the lake and its surroundings were declared a Nature Reserve and the management plan was approved. The reserve includes 4.124 ha, including 3500 ha wetlands.

24. Conservation measures proposed but not yet implemented: (e.g. management plan in preparation; officially proposed as a protected area etc.)

Hornborgasjön SE0540084 have been proposed to the Natura 2000 network both as pSCI and SPA-site.

25. Current scientific research and facilities: (e.g. details of current projects; existence of field station etc.)

Since the restoration of the lake is one of the largest single nature conservation project ever carried out in Sweden, a monitoring programme was established to survey the changes in especially fauna and flora. The main goal of the project was to restore the wetland conditions for birds and therefore the birds play a very important role in the monitoring programme. Other items are vegetation, flora, fish fauna, invertebrate fauna, hydrology and water quality. The SEPA has a combined office and field station at the lake, close to the information centre.

26. Current conservation education: (e.g. visitors centre, hides, information booklet, facilities for school visits etc.)

An information centre - Hornborga Naturum - was built 1985-86 at the eastern shoreline. The centre is open for the public from the end of March to the middle of August. The building offers exhibits, slide shows, cafeteria, and information about the lake, its history and its surroundings. Near the centre there are bird towers, hides and nature trails. There are guides to assist people. Every year 3-4 000 school children are guided, mainly in spring.

A second information centre – Naturum Trandansen- is situated in the south part near the area, which is used by the cranes. The centre is open for public from end of March to end of April. A small exhibition about cranes and a small cafeteria run by tourist organisations from the near-by municipalities of Skara and Falköping is located in the building.

Information can also be found on IT on the address: www.hornborga.com.

27. Current recreation and tourism: (state if wetland is used for recreation/tourism; indicate type and frequency/intensity)

Totally 250 000 people visit the lake per year, mainly during April, watching the famous dancing of the cranes. Besides bird-watching, angling and walking is popular at the lake.

28. Jurisdiction: (territorial e.g. state/region and functional e.g. Dept of Agriculture/Dept. of Environment etc.)

County Administrative Board of Västra Götaland

29. Management authority: (name and address of local body directly responsible for managing the wetland)
County Administrative Board of Västra Götaland, Local Office, S-521 98 Broddetorp, Sweden

30. Bibliographical references: (scientific/technical only)

Hertzman, T. and Larsson, T. 1999. Lake Hornborga, Sweden – the return of a bird lake. Wetlands International Publ. 50, Wageningen, Netherlands.
Hertzman, T. and Larsson, T. 1991. Lake Hornborga - A Case Study. In: Finlayson, C.M. & Larsson, T. (Eds) 1991: Wetland Management and Restoration. - Proc. Workshop, Sweden 1990, Swedish Environmental Protection Agency. Report 3992.

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Annex 1

Noteworthy fauna (additions)

A large colony of black-headed gulls, *Larus ridibundus*, (9 000 pairs in 2001) can also be seen here and also marsh harrier *Circus aeruginosus* (35 pairs, EU Birds directive species). Among the gull colonies, the pochard *Aythya ferina* and tufted duck *A. fuligula* nest. Restored meadows now provide breeding habitat for the lapwing *Vanellus vanellus*, redshank *Tringa totanus* and ruff *Philomachus pugnax* (EU Birds directive species). *Motacilla cinerea* breed regularly.

After the restoration the fish fauna has increased dramatically, especially the perch *Perca fluviatile*, roach *Rutilus rutilus* and pike *Exos lucius*. The growing number of fish has also led to increasing numbers of fish-eating birds like the cormorant *Phalacrocorax carbo*, grey heron *Ardea cinerea*, osprey *Pandion haliaetus* (EU Birds directive species) and white-tailed eagle *Haliaëtus albicilla* (globally and nationally redlisted, EU Birds Directive species). Before the restoration these species were not breeding or showing territorial behaviour at the lake.

The fish fauna consist of 13 species, none of them threatened or redlisted. The most common are the perch, roach and pike. In the main feeder stream, a population of trout *Salmo trutta* is found.

Among mammal species occurring at the lake, the beaver *Castor fiber*, pine marten *Martens martens*, dormouse *Muscardinus avellanarius* and moose *Alces alces* can be mentioned. Seven species of bats have been recorded.

In the bottom fauna Chironomids and worms dominate the macro-invertebrate community. More than 45 000 chironomids per square meter have been found. *Corixids* and water beetles *Coleoptera* and locally *Gammarus* species are the most common among free-swimming invertebrates. The main feeder stream, River Hornborgaån, supports a rich and diverse invertebrate fauna.