

Kristianstads Vattenrike Biosphere Reserve

Periodic Review 2005-2015



This Periodic Review can also be downloaded at www.vattenriket.kristianstad.se/unesco/.

Title: Kristianstads Vattenrike Biosphere Reserve. Periodic Review 2005-2015

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Cover photo: Patrik Olofsson/N

Maps: Stadsbyggnadskontoret Kristianstads kommun

INTRODUCTION

The UNESCO General Conference, at its 28th session, adopted Resolution 28 C/2.4 on the Statutory Framework of the World Network of Biosphere Reserves. This text defines in particular the criteria for an area to be qualified for designation as a biosphere reserve (Article 4). In addition, Article 9 foresees a periodic review every ten years. The periodic review is based on a report prepared by the relevant authority, on the basis of the criteria of Article 4. The periodic review must be submitted by the national MAB Committee to the MAB Secretariat in Paris. The text of the Statutory Framework is presented in the third annex.

The form which follows is provided to help States prepare their national reports in accordance with Article 9 and to update the Secretariat's information on the biosphere reserve concerned. This report should enable the International Coordinating Council (ICC) of the MAB Programme to review how each biosphere reserve is fulfilling the criteria of Article 4 of the Statutory Framework and, in particular, the three functions: conservation, development and support. It should be noted that it is requested, in the last part of the form (Criteria and Progress Made), that an indication be given of how the biosphere reserve fulfils each of these criteria.

The information presented in this periodic review will be used in a number of ways by UNESCO:

- (a) For examination of the biosphere reserve by the International Advisory Committee for Biosphere Reserves and the Bureau of the MAB International Coordinating Council;
- (b) For use in a world-wide accessible information system, notably for the UNESCO-MABnet and publications, facilitating communication and interaction amongst persons interested in biosphere reserves throughout the world.

Kindly indicate if any part of this report should remain confidential.

The form consists of three parts:

- Part one is a summary highlighting the main changes in the biosphere reserve during the reporting period.
- Part two is more descriptive and detailed, referring to the human, physical and biological characteristics as well as to the institutional aspects.
- Part three consists of two Annexes (A): the first Annex (A.1) will be used to update the directory of biosphere reserves on the MABnet. The second annex will be used to provide promotion and communication materials of the biosphere reserve (A.2).

The third annex comprises the Statutory Framework for the World Network of Biosphere Reserves.

Please provide as many quantitative data as possible as well as supporting documentation to complete the information provided, especially:

- Map(s) clearly showing the zonation (see in particular 2.3.1);
- The legal texts for the different zones in cases where formal protection based on national legislation exists.

The form should be completed in English, French or Spanish. Two copies should be sent to the MAB Secretariat, as follows:

1. The original hard copy, with the original signatures, letters of endorsement, zonation map and supporting documents. This should be sent to the MAB Secretariat through the official UNESCO channels, i.e. via the Swedish National Commission for UNESCO and/or the Permanent Delegation to UNESCO.
2. An electronic version (on diskette, CD, etc.) of the periodic review form and of maps (especially the zonation map). This can be sent directly to the MAB Secretariat.

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PART I: SUMMARY

- a) **Name of biosphere reserve:** Kristianstads Vattenrike Biosphere Reserve
- b) **Country:** Sweden
- c) **Year of designation:** 2005
- d) **Year(s) of periodic review(s)** 2015
- e) **Previous recommendation(s) made by the International Co-ordinating Council (MAB ICC), if applicable**

No previous recommendations have been made.

- f) **What follow-up actions are completed and if not completed/initiated, please provide justifications.**

Not applicable, as no previous periodic reviews have been performed for the Kristianstads Vattenrike Biosphere Reserve.

- g) **Update on the implementation of measures to achieve the objectives of the biosphere reserve.**

Since the Kristianstads Vattenrike Biosphere Reserve was designated as a biosphere reserve, we have been working to fulfil UNESCO's criteria by:

1. Integrating the three functions of conservation, development and logistic support in the ten landscape themes selected.
The Biosphere Office has been working from a broad perspective with each of the landscape themes to raise the level of knowledge regarding the value of the landscapes through inventories, drawing on knowledge in development projects with various partners and disseminating information and knowledge through nature interpretation, visitor sites in the landscape or visitor sites;
2. Creating an organisation to promote and coordinate the project.
This task is addressed by an individual administrative unit known as the Biosphere Office and Naturum Vattenriket Visitor Centre within the Municipal Executive Office for Kristianstad Municipality. There is also an established arena for cooperation, dialogue and knowledge exchange between the stakeholders involved through the Consultation Group for the Kristianstads Vattenrike Biosphere Reserve;
3. Working to make nature in the biosphere reserve more accessible.
Planning work for a visitor site for the biosphere reserve had already commenced in the year following the designation of the biosphere reserve. Naturum Vattenriket visitor centre was completed at the end of 2010. It serves as a showcase and meeting

place for stakeholders involved in the biosphere reserve, and signposts the way to the Vattenrike nature and biosphere project for both the local population and tourists. After a period of four years, 500,000 people had visited Naturum Vattenriket visitor centre in 2014.

h) Briefly describe the process by which the current periodic review has been conducted.

The periodic review was initiated in spring 2014 and involved workshops and interviews with stakeholders from the Consultation Group for Kristianstads Vattenrike Biosphere Reserve and staff in the Biosphere Office. This research was conducted by the Stockholm Resilience Centre. Amongst other things, the aims behind this were to facilitate a review of the biosphere activities over the first ten years, to discuss the lessons learned along the way, to allow all stakeholders to voice their opinions, to examine the resilience of the activities and to discuss future strategies.

A new employee was appointed in the Biosphere Office in August to coordinate the work and write the periodic review together with the other staff in the office. This work was subsequently completed by the regular staff of the Biosphere Office. The periodic review was anchored and discussed by the Consultation Group meeting on 23 March. The review was distributed for consultation so that all stakeholders had an opportunity to express their views. The periodic review was determined and approved by the Municipal Council.

i) Area and spatial configuration

| | Previous report (nomination form or periodic review) and date | Proposed changes (if any) |
|--|---|---------------------------|
| Area of terrestrial Core Area(s) | 6,958 ha | No proposed changes |
| Area of terrestrial Buffer Zone(s) | 16,184 ha | No proposed changes |
| Area of terrestrial Transition Area(s) | 67,673 ha | No proposed changes |
| Area of marine Core Area(s) | 221 ha | No proposed changes |
| Area of marine Buffer Zone(s) | 6,715 ha | No proposed changes |
| Area of marine Transition Area(s) | 6,924 ha | No proposed changes |

j) Human population of the biosphere reserve

| | 2005 | 2015 |
|---|-------------|-------------|
| Core Area(s) (permanent and seasonally) | 14/ ? | 12/ ? |
| Buffer Zone (permanent and seasonally) | 1 959/ ? | 1995/ ? |
| Transition Area(s) (permanent and seasonally) | 66 366/ ? | 73 783 /? |

k) Budget (main sources of funds, special capital funds) and international, regional or national relevant projects/initiatives carried out or planned.

| Budget in the previous report (nomination form or periodic review) and date | Current budget |
|---|--------------------------------|
| SEK 5,514,000 (605,000 EUR) | SEK 15,622,200 (1,562,220 EUR) |

The budget may be supplemented to take account of the fact that, since nomination in 2005, the Biosphere Office has been granted around SEK 40 million in external funds for various types of projects relating to sustainable development.

International, regional, multilateral or bilateral framework of cooperation. Describe, where applicable, the contribution of the biosphere reserve to achieve objectives and developing mechanisms that contribute to the implementation of international or regional bilateral or multilateral agreements, conventions, etc.

An example of the framework for cooperation applicable to the biosphere reserve is described below.

Convention on biodiversity – CDB where the goal of conservation and sustainable utilisation of biodiversity is overarching and indicative in the international conservation work. The government bill entitled '**A Swedish strategy for biodiversity and ecosystem services**' is an important tool for working towards the goals of the Convention at national level. The conservation work being performed in the biosphere reserve includes specific control instruments and guidance documents based on this. Various action programmes for threatened species represents one example. The work will be aimed at threatened species and environments through a number of prioritised projects within the biosphere reserve's theme areas. In the management work, collating knowledge, developing management methods and following up results are important strategies. Follow-up, e.g. through survey fishing and inventories for management effects have illustrated that the conservation work in the biosphere reserve has been successful in various ways.

The European Landscape Convention has been ratified by Sweden and entered into force on 1 May 2011. The Landscape Convention is a regional convention for Europe to safeguard and recognise the importance of the surrounding landscape. The work in Kristianstads

Vattenrike Biosphere Reserve has always been carried out from both a landscape and a holistic perspective. Ten theme areas were identified in our application to UNESCO to become a biosphere reserve. The work within the various theme areas is characterised by identifying values, threats and opportunities. Part of the work entails searching for detailed knowledge. This is analysed and converted into specific plans as regards how we should act at landscape level.

The Convention has been drawn up under the European Council and covers the countries that are members of the European Council. The Convention aims to improve the protection, management and planning of landscapes in Europe. It also aims to promote cooperation relating to landscape issues in Europe and to strengthen the participation of the public and local community in the work. The Convention includes all types of landscapes that people encounter in their daily lives and leisure time. The landscape is important to us for cultural and social reasons on account of its environmental value and because it forms the basis for economic development. The parties to the Convention recognise that the landscape has considerable value as an expression of a diverse natural and cultural heritage and for creating identity.

In Kristianstads Vattenrike Biosphere Reserve, there are a total of 39 areas included in the EU's network of protected areas under **Natura 2000** in accordance with the EU's Habitats Directive (SCI) (34 areas) and the EU's Birds Directive (SPA) (4 areas). The objective of the network is to halt the extinction of species and habitats in accordance with international conventions. The biosphere reserve participates actively in the management of the Natura 2000 area. One example is the EU project Sand Life (2012-18), where valuable sandy areas are being restored and the resulting effect on biodiversity is followed up.

In 2000, an **EU directive known as the EU Water Framework Directive** was introduced, specifying the minimum requirements for Member States in terms of water quality and access to water. The Water Framework Directive is based on a common assumption that we must take care of our water resources to ensure the future sustainable use of water. The work must have a perspective centred around the catchment area and involve the public, and in this way create an understanding that water is society's most important resource. Water that is already of good quality must maintain this status, and its condition must not deteriorate. Both chemical and biological parameters must be taken into account when determining the status of water. Sweden was late in implementing this, and it was only in 2004 that the Water Framework Directive was transposed in Swedish legislation when it was incorporated in Chapter 5 of the Swedish Environmental Code.

For Kristianstad Municipality, this means that we have 29 water bodies which must have a good status by 2027. At present, only around 20% of our bodies of water fulfil this requirement (6 out of a total of 29).

The Helgeå Ramsar Site is located entirely in Kristianstads Vattenrike Biosphere Reserve. The wetland area is of great importance for resting, nesting and wintering wetland birds, contains valuable flora and is home to many red-listed fish species. The biosphere reserve has for some time worked with landowners and fishing rights-holders, and implemented measures to preserve and develop values, while at the same time making the wetland area accessible and attractive to visitors. Many nature reserves have been created.

In the autumn of 2014, Kristianstad Municipality decided that the **UN Rights of the Child Convention** should form the basis for all decisions made in Kristianstad Municipality. This means that all management activities must take into account the perspective of a child and that the UN Rights of the Child Convention are to provide guidance in all decisions reached for the various activities in the municipality. An implementation strategy is being developed in order to create a common basic structure for how the work involving implementation, anchoring and execution must be performed.

The work in connection with accessibility for everyone in the biosphere reserve is based on the **UN Convention on the Rights of Persons with Disabilities**. Swedish legislation builds on the Convention and stipulates requirements concerning accessibility and usability for persons with reduced mobility, including through the Swedish Planning and Building Act. We have worked intensively since 2005 in the biosphere reserve to make areas of interest accessible to everyone, for example by creating ramps to birdwatching towers and broad duckboards through wetland environments. We also perform regular guided tours to visitor sites for disabled and elderly persons. The work in connection with accessibility is described in more detail under Article 6.7 and elsewhere.

STERF is a research foundation supporting research and supplying new knowledge to the Nordic golf sector. The Scandinavian Turfgrass and Environment Research Foundation (STERF) was founded in 2006 by the Nordic Golf Association and Nordic greenkeeper associations. STERF processes and supplies research results, which may be applied to various action programmes, instructions and recommendations. 'Ready to use results'. The biosphere reserve has been granted funds by STERF and participated in a Nordic collaboration project linked to the multifunctional use of golf courses, and the Biosphere Office's cooperation with Kristianstad Golf Club can be highlighted as a good example of sustainable development. Together with the golf club, the Biosphere Office has presented the project at international conferences, participated in the production of information material and worked closely with researchers in Norway, Denmark and Sweden regarding the subject of golf courses being an unused resource that may be utilised and developed with the aim of sustainable and diverse use.

PART II: PERIODIC REVIEW REPORT

1. BIOSPHERE RESERVE

1.1 Year designated:

2005

1.2 Year of first periodic review and of any following periodic review(s) (when appropriate):

This is the first periodic review of Kristianstads Vattenrike Biosphere Reserve.

1.3 Follow-up actions taken in response to each recommendation from the previous periodic review(s) (if applicable), and if not completed/initiated, please provide justifications.

Not applicable, as no previous periodic reviews have been performed for the Kristianstads Vattenrike Biosphere Reserve.

1.4 Other observations or comments on the above.

There are no observations or comments in connection with the above.

1.5 Describe in detail the process by which the current periodic review has been conducted:

The periodic review was initiated in the spring of 2014 and involved workshops and interviews with stakeholders involved in the Consultation Group for Kristianstads Vattenrike Biosphere Reserve and staff in the Biosphere Office, which were conducted by a researcher at the Stockholm Resilience Centre. The aims were to facilitate a review of the biosphere activities for the first ten years, to discuss the lessons learned along the way, to allow all stakeholders to voice their opinions, to examine the resilience of the activities and to discuss future strategies for the activities.

Most of the work in connection with the periodic review began in August 2014. A new employee was appointed for this at the Biosphere Office to coordinate the work and to write the periodic review together with the other personnel in the office. The work was performed in accordance with the following plan:

1. Review of the literature and previous documentation;
2. Interviews and consultations with experts in the Biosphere Office throughout the review process to gather background information for the various chapters of the report;
3. Interviews and email contact with various stakeholders (e.g. researchers and civil servants in the municipality) to gather further information and obtain a balanced overview of the ten years of Vattenriket Kristianstads Biosphere Reserve;
4. The first draft of the periodic review was distributed for consultation to various stakeholders (e.g. the Consultation Group, other Swedish biosphere reserves, the

Swedish MAB Committee, authorities, politicians, civil servants, landowners, researchers, associations and organisations) and was made available to the public at Kristianstad City Hall and at Naturum Vattenriket visitor centre. The periodic review was also available via the Vattenriket website, which allowed all interested persons and stakeholders to be involved in the work and submit their views on the work of the Biosphere Office during the first ten years of the biosphere reserve;

5. A meeting was held with the Consultation Group focusing on the periodic review. This meeting anchored the work and enabled views on the periodic review to be obtained, but it also allowed views concerning the future of the biosphere reserve to be gathered;
6. Responses to the consultation and viewpoints from the Consultation Group were included in the report to ensure greater objectivity and obtain views from a greater number of sources in the final version.
7. The periodic review was considered by both the Municipal Board and the Municipal council, so that the review is politically anchored and so that a decision can be reached meaning that the highest political body in the municipality endorses the periodic review;
8. The report was translated into English and submitted to the Swedish MAB Committee before being submitted to UNESCO.

1.5.1 Which stakeholders were involved?

All stakeholders in the Consultation Group and researchers at the Stockholm Resilience Centre have participated. The first draft of the periodic review was distributed for consultation to various stakeholders to obtain their views (e.g. the Consultation Group, other Swedish biosphere reserves, the Swedish MAB Committee, authorities, politicians, civil servants, landowners, researchers, associations and organisations) and was made available to the public at Kristianstad City Hall and at Naturum Vattenriket visitor centre. The periodic review was also available via the Vattenriket website, which allowed all interested persons and stakeholders to be involved in the work and submit their views on the work of the Biosphere Office during the first ten years of the biosphere reserve; The periodic review was considered by the Municipal Council with the objective of receiving its support.

1.5.2 What methodology was used to involve stakeholders in the process (e.g., workshops, meetings, consultation with experts).

Two workshops were held for introductory purposes during 2014 by a researcher from the Stockholm Resilience Centre. Representatives of the Consultation Group and other stakeholders in the biosphere reserve participated in connection with this. A meeting in March 2015 focused on the periodic review in order to further involve the Consultation Group and to obtain valuable input from participants. Furthermore, staff at the Biosphere Office, experts, researchers and civil servants in the municipality and government authorities were consulted regarding specific issues. The periodic review was presented at Kristianstad City Hall and Naturum Vattenriket visitor centre and was made available on the Kristianstads Vattenrike website to ensure that the periodic review is well-anchored locally and to give the public the opportunity to submit views and ideas. National coordinators were invited to submit their views, along with the Swedish MAB Committee and the Swedish National Commission for

UNESCO. The periodic review was considered and a decision reached regarding this by both the Municipal Board and the Municipal Council in Kristianstad Municipality.

1.5.3 How many meetings, workshops, etc. occurred throughout the process of conducting this review?

Two workshops were held by a researcher from the Stockholm Resilience Centre. A consultation meeting was entirely dedicated to the periodic review, and many internal and external meetings were dedicated to gathering knowledge and discussing the work throughout the periodic review process.

1.5.4 Were they well attended, with full and balanced representation?

(Describe participation and stakeholders).

Both workshops were well-attended, with over 30 participants contributing on both occasions. About the same number of people also participated in the Consultation Group meeting. The genders were equally represented on both occasions.

2. SIGNIFICANT CHANGES IN THE BIOSPHERE RESERVE DURING THE PAST TEN YEARS

2.1 Brief summary overview: Narrative account of important changes in the local economy, landscapes or habitat use, and other related issues. Note important changes in the institutional arrangements for governance of the biosphere reserve area, and changes (if any) in the coordinating arrangements (including the biosphere reserve organization/coordinator/manager) that provide direction for the biosphere reserve. Identify the role of biosphere reserve organization/coordinator/manager in initiating or responding to these changes.

Dialogue and cooperation have been crucial success factors for the first ten years of Kristianstads Vattenrike Biosphere Reserve. The work builds on good examples and interested stakeholders. The method is sometimes described using the term 'adaptive co-management'. Since nomination in 2005, a closer cooperation has been developed between various administrations in Kristianstad Municipality and the Biosphere Office.

Certain changes have occurred regarding the use of the landscape and nature types during the ten-year period. Agriculture in Kristianstad Municipality has expanded and intensified. Organic agriculture has also become increasingly popular at the same time. The use of arable land for organic cultivation has almost doubled in Kristianstad Municipality during the past 10 years, with lower loads of artificial fertilisers and pesticides as a result.

The conservation work has been very successful during the ten years of the biosphere reserve. Several new nature reserves have been established (2,275 ha), and the work relating to sandy grasslands and freshwater and marine areas has been developed and the conservation work has become better integrated with the work to promote sustainable development.

The continuous collection and review of new information, relating to natural assets, protection and management methods for making well-founded decisions, is an important part of the conservation process. Since the application, information has been built up through various inventories and compilations of existing information. Information relating to threatened species in the biosphere reserve has increased significantly, and the number of known threatened species has therefore also increased. Overall, the number of red-listed species in the reserve rose from 637 to 775 during the period 2005-2015. Another key aspect of the conservation work is presenting clear and interesting information. This method of working has been developed and expanded in the work of the Biosphere Office during the past ten years.

At the time of the application, the conservation work primarily comprised the restoration and management of wet grasslands along the River Helge å. The work has gradually been expanded to cover ten separate theme areas. The Biosphere Office initiates and carries out projects to conserve and develop the value of the biosphere reserve and to meet the changes taking place in the landscape.

The work to fulfil the development function of the biosphere reserve goes hand-in-hand with the conservation work and information dissemination in a good dialogue with stakeholders.

There has been a positive development in relation to research over the ten-year period. Funds have been granted to a number of major research projects which focus on ecosystem services with a strong relationship to the biosphere reserve.

Since the application, the tourism industry has expanded, particularly nature tourism in the Kristianstads Vattenrike Biosphere Reserve. Active holidays involving an element of learning are becoming increasingly popular.

A multifunctional golf course has been created on which playing golf, recreation and natural values coexist. New wetland areas have been excavated in the agricultural landscape. Several new products from the biosphere reserve have been developed. Beef from wet grasslands and smoked goose breast are two examples of this.

Kristianstads Vattenrike Biosphere Reserve's long-term communication work involves creating a change in attitudes regarding sustainable development. The fact that the Swedish Environmental Protection Agency and the politicians of Kristianstad reached a decision to build the Naturum Vattenriket visitor centre is evidence of the fact that attitudes towards wetland areas have changed from viewing them merely as waterlogged areas to rich wetlands. The Naturum Vattenriket visitor centre was opened in 2010 and has had 500,000 visitors. The visitor centre increases the potential to obtain information about the work of the biosphere.

The number of staff working in the Biosphere Office has almost doubled since the application. Thirteen full-time employees now work in the office. In addition, project employees are also employed as required, in addition to 130 biosphere ambassadors working as volunteers. In autumn 2013 Sven-Erik Magnusson retired and Carina Wettemark is now the coordinator.

Almost all the goals and visions established for the Biosphere Office's action programme for 2010-13 have been either implemented or initiated. Since 2005, the Biosphere Office has applied for and been awarded SEK 40 million in external project funding.

2.2 Updated background information about the biosphere reserve.

Kristianstads Vattenrike Biosphere Reserve is located in the southernmost landscape of Sweden, Skåne. The area covers the lower catchment area of the River Helge å in Kristianstad Municipality and the coastal areas of the Hanöbukten bay, which forms part of the Baltic Sea. The area, which covers around 100,000 hectares, contains landscapes and biological assets of international, national and regional importance.

The area's special morphology, geology and the contact of lakes and watercourses with the brackish waters of the Baltic Sea and varying local climate have created unique conditions for multifaceted land use. In turn, this has provided space for a variety of ecosystems and a large diversity of species. Much of the area's value in this cultural landscape is a result of man's long-term use of the land, but some areas also provide a biologically valuable sanctuary that are not dependent on human activities.

Total area of biosphere reserve:

104,375 ha, (approximately 1 044 km²), which comprises 90,515 ha (approximately 905 km²) of freshwater and terrestrial environments and 13,860 ha (approximately 139 km²) of marine environments).

Administrative area:

Municipality: Kristianstad Municipality

County: Skåne county

Country: Sweden

Protected area:

- 34 Natura 2000 sites covering an area of 4,778 ha in accordance with the EU's Habitats Directive (SCI)
- 4 Natura 2000 sites covering an area of 4,376 ha in accordance with the EU's Birds Directive (SPA)
- 30 nature reserves covering an area of 4,599 ha
- 43 areas with habitat protection covering an area of 92 ha
- 1 Ramsar Convention Site covering an area of 8,050 ha
- 14 areas of national interest for nature conservation

Nature and land use types:

Lakes and flowing watercourses, grazing land and hay meadows, deciduous and coniferous forest, coastal ecosystems, marine ecosystems, agricultural land and urban areas.

Maximum height above sea level:

Approximately 190 m above sea level (at Linderösåsen west of Östra Sönnarslöv)

Minimum height above sea level:

On land 2.32 m below sea level RH2000 (This is Sweden's lowest point on land, which is below sea level in the **embanked** Nosabyviken inlet.) The bottom of Lake Råbelövssjön is approximately 9 metres below sea level. (The lake is 11 metres deep).

Greatest depth beneath mean sea level for coastal/marine area:

19 m.

Climate:

The area has a warm temperate climate according to the Köppen climate classification.

Average temperature:

16.9°C during the warmest month, -1.7°C during the coldest month in accordance with the Swedish Meteorological and Hydrological Institute's (SMHI) data from 2013 (SMHI 2015).

Total annual precipitation:

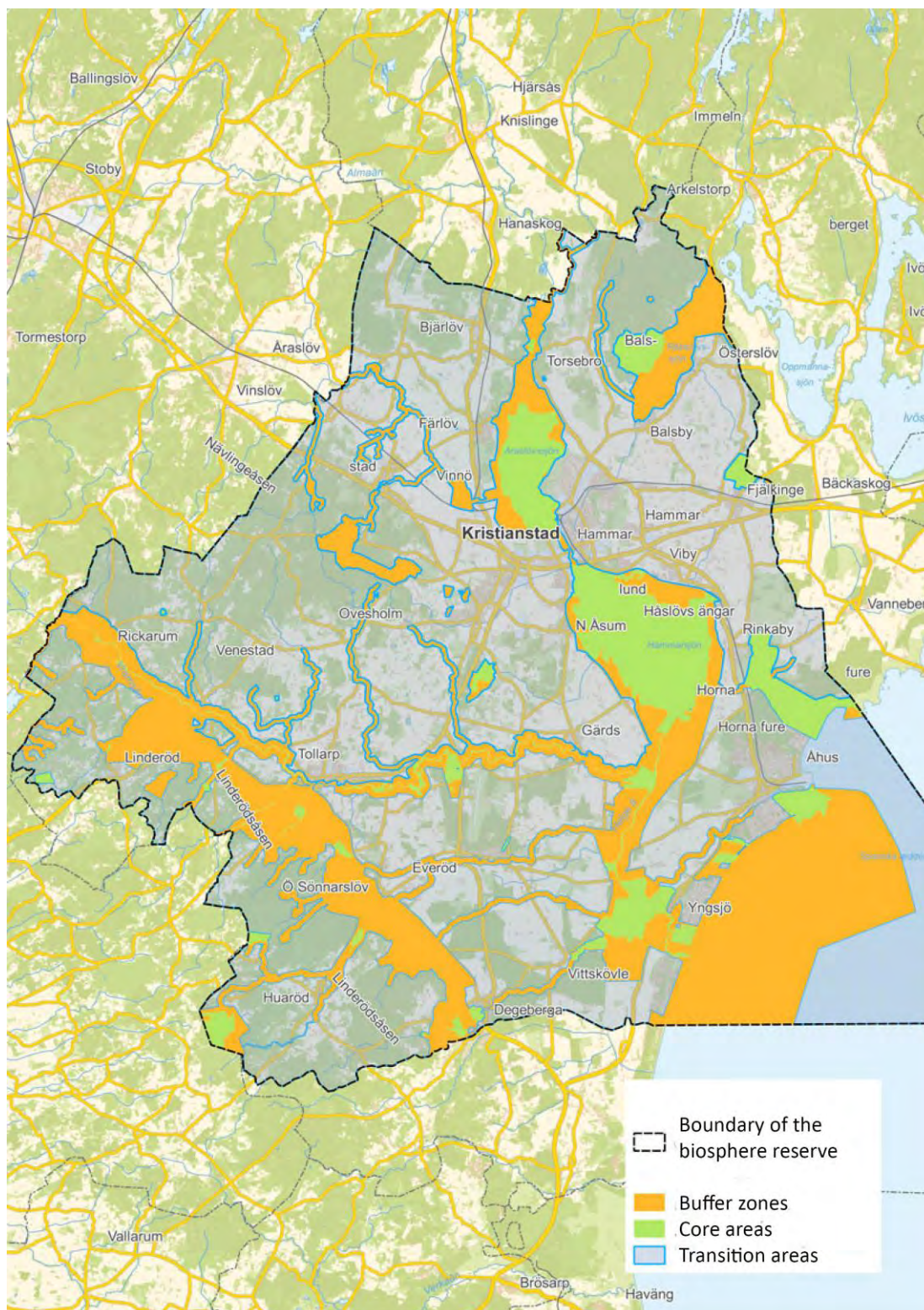
550.9 mm during 2013 (SMHI 2015).

2.2.1 Updated coordinates (if applicable). If any changes in the biosphere reserve's standard geographical coordinates, please provide them here (all projected under WGS 84):

| Cardinal points | Latitude | Longitude |
|--------------------|-------------|-------------|
| Most central point | 56°01'57''N | 14°08'58''E |
| Northernmost point | 56°10'26''N | 15°13'15''E |
| Southernmost point | 55°48'14''N | 13°58'42''E |
| Westernmost point | 55°56'13''N | 13°45'04''E |
| Easternmost point | 55°51'33''N | 14°28'42''E |

2.2.2 If necessary, provide an updated map on a topographic layer of the precise location and delimitation of the three zones of the biosphere reserve Map(s) shall be provided in both paper and electronic copies. Shape files (also in WGS 84 projection system) used to produce the map must also be attached to the electronic copy of the form.

Download the shape files from <http://www.vattenriket.kristianstad.se/unesco/>



2.2.3 Changes in the human population of the biosphere reserve.

| | 2005 | 2015 |
|---|-----------|-----------|
| Core Area(s) (permanent and seasonally dependent) | 14/ ? | 12/ ? |
| Buffer Zone(s) (permanent and seasonally dependent) | 1,959/ ? | 1,995/ ? |
| Transition Area(s) (permanent and seasonally dependent) | 66,366/ ? | 73,783 /? |

2.2.4 Update on conservation function, including main changes since last report.

The establishment of a good dialogue and cooperation between stakeholders is key to successful conservation work and building trust. The continuous collection and review of new information relating to assets, protection and management methods for making well-founded decisions is also an important part of the conservation process. Clear and interesting information is also key. This method of working has been developed and expanded in the work of the Biosphere Office during the past ten years.

At the time of the application, the conservation work primarily comprised the restoration and management of wet grasslands along the River Helge å.

The strategic work was expanded to cover more valuable nature types in the action programme for 2004-2007, determined by the municipality and county administrative board and anchored in the Consultation Group. Ten theme areas were proposed in the action programme that the work must focus on (see section 4.2).

The conservation work relating to *Sandy grasslands* is to be intensified in connection with the establishment of the biosphere reserve. Since then, the activities and projects have been expanded gradually and are now being carried out within all ten thematic areas to varying degrees.

The conservation work has been very successful. Several new nature reserves have been established, and the work relating to freshwater and marine areas has been developed and the conservation work has become better integrated with the work to promote sustainable development. The focus of the work has been adapted in many cases as appropriate following a negative impact on the ecosystem as a result of both natural and anthropogenic causes (see 4.1). Examples are given below of measures and projects that have been carried out and/or are being carried out within some of the theme areas (see question 4.2 for details):

The rich wetland areas along the River Helge å

- Continued cooperation with land users in order to maintain the traditional management of wet grassland to preserve and develop biodiversity. Eight nature reserves covering a total area of 2,275 ha have been established;
- Studies of bird life and soil chemistry to investigate the consequences of the summer floods in 2007;
- At Hamilton Hill and Näsby Fält, two wetland areas, of 55 and 20 hectares respectively, have been recreated by removing old embankments;
- Development of crane and goose management to protect spring planting carried out by farmers;

Sandy grasslands formerly managed under a rotational system of cultivation and fallow

- Areas of sandy grasslands have been protected through the use of protection and management;
- Knowledge of the natural value of sandy land and threatened species has been improved through the preparation of inventories;
- The general level of awareness regarding the value of sandy land and threats has been increased through information campaigns.

The coastal landscape with extensive sand dunes

- Restoration and information with a focus on valuable sandy land in the dune landscape through the EU project Sand Life.

The coastal waters of Hanöbukten bay

- Extensive project activity is under way to improve water quality and raise the level of knowledge regarding natural values in the Hanöbukten bay.

Lakes and watercourses

- Around 150 hectares of wetland have been created along our various watercourses in connection with various projects with a focus on eutrophication and biodiversity. This work is continuing and we are establishing around 25 hectares of new wetland per year;
- Various watercourses are being restored on an ongoing basis in order to recreate good spawning and nursery areas for various species of fish;

Follow-up work and measures for our red-listed species is ongoing (Thick shelled river mussels Mussel (*Unio crassus*), Freshwater pearl mussels (*Margaritifera margaritifera*), Salmon (*Salmo salar*) and European catfish (*Silurus glanis*))

Information has been collated and there has been cooperation with landowners regarding increased awareness and the implementation of measures in order to investigate and rectify the consequences of brownification.

Nature in the vicinity of urban areas

- Wetlands in the vicinity of urban areas near Naturum Vattenrike visitor centre have been addressed through a joint project between the administrations concerned and this has been politically anchored. This resulted in the establishment of a new nature reserve to protect the valuable wetlands, but it also offers the potential to develop natural and experience assets for the residents of the future urban district of Vilans Strandäng;
- Constructive discussions have been held with developers in urban and shore line locations in the sandy shore zone beside the River Helge å in Åhus. Extensive work has also been carried out in Åhus in connection with the establishment of three sandy grasslands nature reserves, which was carried out with the aim of conserving nature close to urban areas with a high recreational value as well as the very high natural values associated with the sandy environments;
- A constructive and successful cooperation with the golf course has taken place in Åhus, which both resulted in the public being able to access and pass through the golf course and facilitated the conservation of the value of the sandy land.

The entrances to Åhus have been developed in a very positive manner with increased biodiversity and enhanced cultural history as a result of a joint project with the technical administration. This involves the annual mowing and collection of the grass combined with intervals where the areas are ploughed. The entrances to Åhus now flourish in the summer, to the benefit of residents, visitors and biodiversity, and management costs are also kept down at the same time. Benefiting man and nature!

2.2.5 Update on the development function, including main changes since last report.

The work to fulfil the development function of the biosphere reserve goes hand-in-hand with the preservation work and information dissemination in a good dialogue with stakeholders.

Some good examples are:

- General increase in tourism generally and nature tourism in the Kristianstads Vattenrike Biosphere Reserve in particular;
- Multifunctional golf course where golf, recreation and natural values coexist;
- Wetland restoration in the agricultural landscape;

Many new products from the biosphere reserve, e.g. beef from wet grassland and smoked goose breast.

2.2.6 Update on logistic support function, including main changes since last report.

The long-term communication work of the Biosphere Office is based around creating a change in attitudes towards sustainable development – for the benefit of man and nature. That the Swedish Environmental Protection Agency and the politicians of Kristianstad decided to build the Naturum Vattenriket visitor centre is evidence of the fact that attitudes towards wetland areas have changed from viewing them as rich wetlands to waterlogged areas and now rich wetlands once again.

The Naturum Vattenriket visitor centre serves as both a visitor centre and meeting place for Kristianstads Vattenrike Biosphere Reserve. The visitor centre was opened in 2010 as the direct result of a decision by UNESCO to designate Kristianstads Vattenrike as a biosphere reserve.

All information concerning the biosphere reserve has been collated in a comprehensive and interactive website since 1995. This website continues to play a crucial role as a support function, news service and information archive.

The Biosphere Office started using social media in connection with the opening of the Naturum Vattenriket visitor centre. Using Facebook and Instagram has allowed us to reach people who are interested, who then like, share and add comments.

Media contact is important in the Biosphere Office's communication work. A journalist was appointed in 2010 to write press releases and invite the media to take an interest in the biosphere reserve.

Visitor sites are essential for people to enjoy and take an interest in the landscape. Over the past ten years, the Biosphere Office has produced new information signs and exhibitions and ensured that visitor sites are clearly signposted and made more accessible.

The Naturum Vattenriket visitor centre's nature educator is visited by three school classes a

week. A biosphere camp is held for 30 schoolchildren aged 10-14 during the summer holidays.

The Biosphere Office began training 'biosphere ambassadors' in March 2013. These ambassadors will generate interest in and disseminate knowledge of Kristianstads Vattenrike Biosphere Reserve to colleagues, customers, friends, family and associations. A total of 130 ambassadors have so far been trained.

Research is under way in a number of different subject areas, and is being undertaken by university colleges, universities and government institutions. The biosphere reserve and biosphere activities attract researchers from other parts of the world and the reserve has been mentioned in several international scientific periodicals.

Kristianstad University is the most important node for higher education owing to its location in the middle of the biosphere reserve. The university has over 14,000 students.

The Stockholm Resilience Centre (part of Stockholm University), the Swedish University of Agricultural Sciences (SLU) and Lund University are institutions that use Kristianstads Vattenrike Biosphere Reserve in connection with course content at an advanced level.

Many research and monitoring programmes have been conducted over the past ten years that have assisted with the biosphere activities and helped to develop them. A complete list can be found under Chapter 6.2 below.

2.2.7 Update on governance management and coordination, including changes since last report (if any) in hierarchy of administrative divisions, coordination structure.

At the time of nomination, the Biosphere Office was organised directly under the Municipal Board. For the past few years, the office has belonged to the Municipal Executive Office and the Civic Department, which are organised under the political management of the Municipal Board. The number of staff at the Biosphere Office has been increased to 13 since nomination, and Carina Wettemark has been the new coordinator since the autumn of 2013, following the retirement of the previous coordinator Sven-Erik Magnusson. See also chapter 7 for further information.

2.3 The authority/authorities in charge of coordinating/managing the biosphere reserve:

Kristianstad Municipality is the authority that is responsible for the biosphere reserve, as was the case at the time of nomination, and is responsible for the management of the area as a whole. The Biosphere Office falls under Kristianstad Municipality and is responsible for the coordination of its own work and projects in the biosphere reserve, in addition to supporting and initiating projects that can be implemented by other stakeholders, provided they fulfil the criteria of the biosphere reserve for conservation and development and fall within the framework of the action plan. The office has no official authority, but it does prepare background information and proposals for decisions for local, regional and national bodies. With regard to protected areas inside the core areas and buffer zones, the Swedish environmental Protection Agency and local and regional authorities such as Kristianstad Municipality, the County Administrative Board of Skåne and the Swedish Forest Agency are responsible for ensuring that applicable laws are followed.

The biosphere activities have broad political support within Kristianstad Municipality. This support, together with a straightforward and direct dialogue with the political management, is essential in order to continue the biosphere activities in a successful way in the future.

2.3.1 Updates to cooperation/management policy/plan, including vision statement, goals and objectives, either current or for the next 5-10 years

The current action plan covers the period 2010-2013, and differs from previous action plans in that its implementation focuses on the three functions of the biosphere reserve. Visions, goals and guidelines and projects exist for each function, as well as for the visitor centre's activities (see question 7.7.2 for further details). The action plan for the period 2010-2013 has been successfully implemented, and virtually all of the established goals and visions have been implemented or initiated (see 7.7.5 for more information). The work to develop a new action plan will begin in the autumn, and the Biosphere Office will, amongst other things, focus on the goals below (see chapter 9 for more detailed information):

- Kristianstads Vattenrike Biosphere Reserve will continue to fulfil UNESCO's criteria and intentions for biosphere reserves;
- Naturum Vattenriket visitor centre will continue to fulfil the requirements and intentions of the Swedish Environmental Protection Agency for visitor centres in Sweden;
- To continue the work towards sustainable development benefiting both man and nature in Kristianstads Vattenrike Biosphere Reserve and within Kristianstad Municipality;
- Kristianstads Vattenrike Biosphere Reserve and Naturum Vattenriket visitor centre will continue to be an important part of the prioritised tasks for Kristianstad Municipality, and in this way contribute to the attractiveness and development of Kristianstad;
- That Naturum Vattenriket visitor center will continue to grow in importance as a meeting place for Kristianstads Vattenrike Biosphere Reserve;
- To continue the work on the three functions of conservation, development and logistic support in the ten identified theme areas;
- To work towards increased biodiversity in the biosphere reserve;
- To make it easier for the public, pupils and researchers to share in the value of the biosphere reserve through good logistical support (website, visitor sites, visitor centre, information material, information in the landscape, social media, paths with boardwalks and signposts, etc.), and improve the accessibility of Vattenriket for everyone;
- To continue the good partnership with the public, landowners, users, residents, visitors, entrepreneurs, associations, consultation groups, universities, university colleges, organisations, civil servants, authorities, politicians and other institutions, etc. to work towards sustainable development in Kristianstads Vattenrike Biosphere Reserve and to safeguard traditional and cultural knowledge;
- To work to communicate and highlight the concept of ecosystem services.

2.3.2 Budget and staff support, including approximate average annual amounts (or range from year-to-year); main sources of funds (including financial partnerships established (private/public), innovative financial schemes); special capital funds (if applicable); number of full and/or part-time staff; in-kind contribution of staff; volunteer contributions of time or other support.

The Biosphere Office and visitor centre has an annual (2014) budget of SEK 15,622,200 (EUR 1,562,220), which is largely financed by Kristianstad Municipality. This amount includes SEK 400,000 which the Swedish Environmental Protection Agency has provided for biosphere activities, as well as SEK 300,000 for visitor centre activities.

Grants for individual projects are applied for in addition to the annual budget, either internally or together with partners. Project initiatives can themselves also generate revenue for future projects or for landowners and the municipality, etc. The grants also make it possible to take on more employees, which in turn increases the scope to apply for further grants. The Biosphere Office has been granted around SEK 40 million in external funding since nomination in 2005.

C4 Teknik (technical management) in the municipality and the county administrative board of Skåne now manage many of the areas (municipal and government owned conservation areas and nature reserves, etc.), in which the Biosphere Office has initiated and carried out activities aimed at conservation, development and information, including the establishment of visitor sites.

The number of staff at the Biosphere Office has almost doubled since the application. Thirteen full-time employees are now employed in the office, and this expansion is largely due to the creation of the visitor centre. In addition to this, there are project employees for individual projects (with numbers varying depending on the project), in addition to around 130 biosphere ambassadors working as volunteers.

2.3.3 Communications strategy for the biosphere reserve including different approaches and tools geared towards the community and/or towards soliciting outside support.

The Biosphere Office works on communication in a broad perspective. The target groups are numerous, as are the channels. The long-term overall goal of the communication is to bring about a change in attitudes towards sustainable social development that is benefiting man and nature.

We will achieve this by providing information about Kristianstads Vattenrike Biosphere Reserve, such as:

1. A model area for sustainable development that works on behalf of UNESCO on the three functions of conservation, development and logistic support by publicising the Vattenrike Biosphere Reserve's projects and results;
2. An exciting visitor destination in the form of the Naturum Vattenriket visitor centre and its programme activities and educational activities as a starting point for excursions to over 20 visitor sites in the reserve.

The information provided by the Biosphere Office is aimed at many different target groups with differing levels of prior knowledge and roles. The target groups are: the general public, associations and companies in Kristianstad, school classes and families with children in Kristianstad and surrounding area, university college and university students, teachers and researchers, e.g. from Kristianstad, Lund and Stockholm, tourists and visitors from Skåne,

Denmark and Germany, wheelchair users and other visitors with disabilities, decision-makers and civil servants at local, regional and national levels and the media at local, regional and national levels.

The channels cover information in the landscape, the website and Facebook, folders, brochures, reports and books, audio guides and films, contact with the media and marketing. The website contains information on the biosphere activities, landscape, visitor sites, projects, reports and visitor centre programmes. The site also serves as an archive and webzine through the news blog. The website has 300,000 visitors per year. Naturum Vattenriket visitor centre has 2000 followers on Facebook. Visitors have also been able to tag Vattenriket on Instagram since 2014. Images are displayed in real time in the exhibition and on the website.

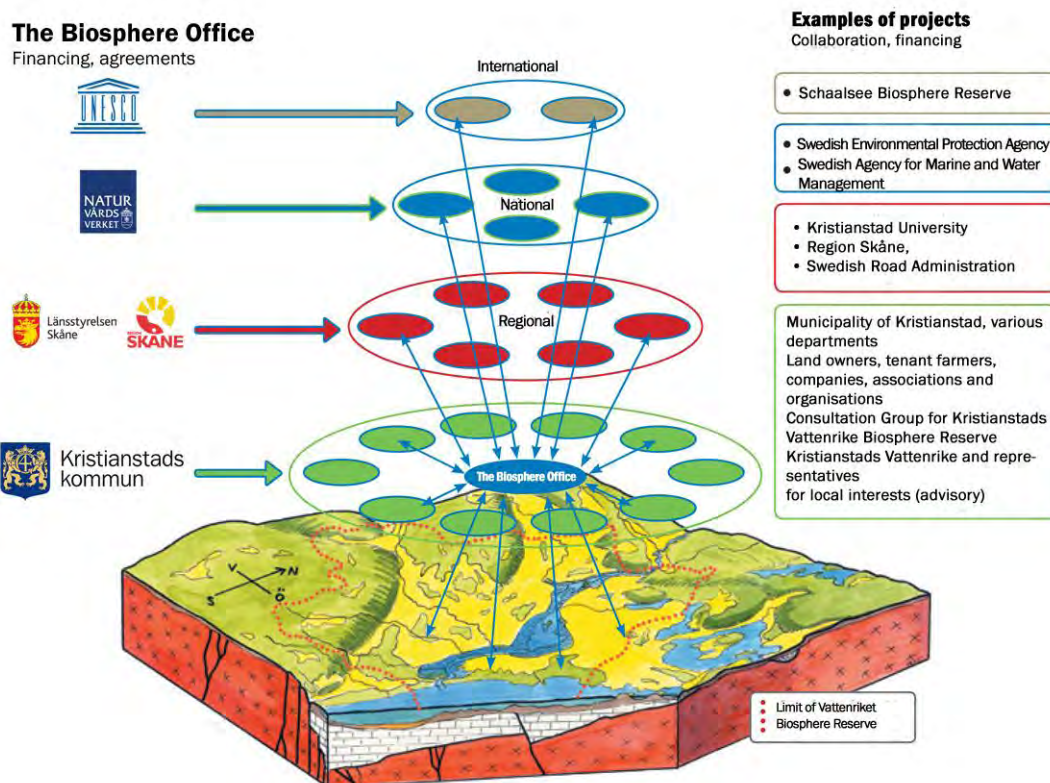
The visitor centre and website contains printed material in the form of folders and brochures, the publication series entitled 'Vattenriket in focus' (Vattenriket i fokus) and books. Audio guides and film clips can be accessed via the QR codes in the landscape and also from the website. The Biosphere Office started training biosphere ambassadors several years ago. These ambassadors help to anchor the biosphere activities in the local community.

2.3.4 Strategies for fostering networks of cooperation in the biosphere reserve that serve as connections (“bridging”) among diverse groups in different sectors of the community (e.g. groups devoted to agricultural issues, local economic development, tourism, conservation of ecosystems, research and monitoring).

The strategy for promoting cooperation between different stakeholders in various sectors has primarily involved creating different arenas for discussion and dialogue. The extensive network of the Biosphere Office's staff allows us to act as a bridge and initiate meetings and create the conditions necessary for cooperation and dialogue between stakeholders at various levels. One of the strategies has been to establish various groups for specific purposes. The work of the Consultation Group for Kristianstads Vattenrike Biosphere Reserve has been important in promoting dialogue and cooperation between local and regional stakeholders from politicians and civil servants to representatives from agriculture, tourism and various organisations as regards how the biosphere reserve is to be managed.

The work with the crane and goose groups has helped to continue the good cooperation between the county administrative board, Kristianstad Municipality and agricultural and ornithological associations in the management of the crane and goose populations. New cooperation groups are formed when new projects are started and these contribute to the dialogue and exchanges between stakeholders from various sectors and community levels, e.g. between farmers and authorities. The Biosphere Office also has an active network with many different researchers and helps to establish contacts between researchers as well as between researchers and local stakeholders.

The Biosphere Office also acts as a bridge between stakeholders at local, regional and national levels due to our extensive network. The Biosphere Office and biosphere activities have attracted the attention of researchers because of their ability to facilitate cooperation between stakeholders from various levels and sectors (e.g. Olsson et al. 2004, Hahn et al. 2007, Schultz 2009). This is demonstrated schematically on the following page.



The Biosphere Office also acts as a bridge between stakeholders at local, regional and national levels.

2.3.5 Particular vision and approaches adopted for addressing the socio-cultural context and role of the biosphere reserve (e.g. promotion of local heritage resources, history, cultural and cross-cultural learning opportunities; cooperation with local population; reaching out to recent immigrant groups, indigenous people etc.).

Naturum Vattenriket visitor centre acts as both a visitor centre and a meeting place for the biosphere reserve. The visitor centre has a comprehensive and very broad programme of activities for all target groups. Here, nature activities coexist with literature, film, poetry, history and music. For example, 'Music in the nest' (Musik i redet), where Handel's Water Music is played annually by the local symphony orchestra, is particularly appreciated.

Kristianstad celebrated its 400th anniversary during 2014. This provided us with an opportunity to inaugurate a new historical exhibition in the Canal House Outdoor Museum for the biosphere reserve. Kristianstad's history is closely linked to water. It was the Danish King Christian IV who in 1614 decided to build the city and use water as protection. Now, 400 years later, it is the biosphere reserve that protects the values associated with the water instead.

During 2014, the visitor centre also produced historical guides, and the nature guides at the visitor centre provided visitors with a historical tour using the water and wetlands as a starting point. With the aid of historical maps, they touched on the water-related incidents that have affected the city, nature and people the most through the centuries.

People from all walks of life enjoy coming to the visitor centre. This includes all age groups, both women and men and both Swedish and foreign visitors. Many newly arrived immigrant

groups visit the visitor centre through SFI (Swedish for Immigrants), which is a course offered to all new arrivals in Sweden.

2.3.6 Use of traditional and local knowledge in the management of the biosphere reserve.

Knowledge regarding traditional use is an important factor in the work to conserve and manage valuable natural areas in the biosphere reserve. High natural values combined with the presence of threatened species are usually linked to a long history of human activity. Examples of areas where traditional knowledge is used regularly are in connection with restoration, grazing and mowing in the characteristic wet grasslands and in connection with the management of the valuable sandy grassland in the agricultural land. Projects where drained wetlands and straightened watercourses are restored to their original state are other examples of areas where local traditions and knowledge may be used.

The cultural/historical aspects are important in the educational work to generate interest in and awareness of valuable nature. An insight into an area's land use history and the importance of returning to a previous stage to save threatened values can increase understanding and interest. Old maps and photographs serve as a supplementary instrument for the restoration of, for example, drained wetlands and straightened watercourses and for the restoration of overgrown sandy areas, both in order to plan measures and to illustrate target images.

2.3.7 Community cultural development initiatives. Programmes and actions to promote community language, and, both tangible and intangible cultural heritage. Are spiritual and cultural values and customary practices promoted and transmitted?

An important aspect of the biosphere activities has been to safeguard local knowledge relating to both culture and nature and to pass on this knowledge. Many of the biosphere reserve's values are related to the long-term use of the land, and many important ecosystems and species are dependent on the preservation of the cultural landscape. There are also many culturally important management methods and occupations that are at risk of being lost if these traditions are not preserved and the knowledge passed on. Some important activities that should be mentioned in relation to this question are:

1. **The traditional management of wet grassland** – the work aims to safeguard knowledge relating to traditional management through grazing and mowing, and to promote this form of management being preserved and resumed by more farmers;
2. **The rotation system of cultivation and fallow** – the work in connection with the theme area of Sandy grasslands has revolved around the basic aim of safeguarding old knowledge relating to land use in order to allow the conservation and development of natural values found in the landscape of the present. There is a cultivation demonstration at Sånarna Outdoor Museum (Utemuseum Sånarna) showing how the land in the area was used up until the mid-1950s using the rotation system of cultivation and fallow. This meant that the land was cultivated and sown with rye, for example, one year and was then left for a long fallow period (5-20 years), when the land was allowed to build up nutrients and could be used for cattle grazing;
3. **Eel fishing on the Eel Coast (Ålakusten)**– The Biosphere Office supports the survival of the eel fishing culture in the biosphere reserve. There are active fishermen with an interest in eel fishing, and there is also genuine interest in preserving the species and the associated culture. The Biosphere Office supports the 'Association for

eel fishing on the eel coast as world heritage' (Föreningen för ålakustens ålafiske som världsarv), which is working to ensure that eel fishing becomes a piece of intangible world heritage;

4. **The biosphere camp** – children get to meet various stakeholders and learn about old crafts and techniques, e.g. yarn carding during the biosphere camp. This helps to ensure that the knowledge and culture are passed on to the next generation;
5. **The Naturum Vattenriket visitor centre** – visitors to the visitor centre or participants in the visitor centre's programme items can among other things learn about the history of the Kristianstad area, which has contributed to the current cultural landscape, which is important for both man and nature.

2.3.8 Specify the number of spoken and written languages (including ethnic, minority and endangered languages) in the biosphere reserve. Has there been a change in the number of spoken and written languages? Has there been a revitalization programme for endangered languages?

The main language spoken in the biosphere reserve is Swedish.

Other languages spoken in the biosphere reserve relate to the various nationalities represented in the municipality. There are 12,338 people of foreign nationality living in Kristianstad Municipality, and over 4,500 people with two parents with a foreign background. Based on the most common nationalities, the most common languages other than Swedish are Arabic, Kurdish and Polish.

2.3.9 Management effectiveness. Obstacles encountered in the management/coordination of the biosphere reserve or challenges to its effective functioning.

The staff at the Biosphere Office have been working in dialogue and cooperation with local stakeholders in the area since 1989. The work has been developed on the basis of good examples and interested stakeholders, which has then spread with a ripple effect and developed into larger projects/measures. Much of the work is about creating and developing trust between the staff of the Biosphere Office and the various stakeholders located in the landscape. This way of working is sometimes described using the term 'adaptive co-management', and has had a major impact on the effectiveness of the work of the Biosphere Office in the biosphere reserve. The close cooperation that has been built up between various authorities, such as the county administrative board and the Swedish Forestry Agency, has also facilitated the effectiveness of the biosphere activities.

The challenge facing the management is that people, civil servants and politicians 'come and go', and there is a need for the constant updating of people in the network and their knowledge of the biosphere reserve/biosphere activities if the management is to be effective. Another challenge is obtaining funding to implement projects and measures, and to find competent and experienced personnel with a good knowledge of the biosphere reserve and the work.

In 2014, a research group at the Stockholm Resilience Centre (Sweden) and Brock University (Canada) performed a 'resilience assessment' of the Kristianstads Vattenrike Biosphere Reserve through interviews, a questionnaire survey and two workshops. The researchers

collated the existing knowledge and perceptions of the participants with regard to both the cooperation process (management/coordination) and its results.

This resilience assessment provided a considerable amount of positive feedback regarding the method of working and results in the biosphere reserve. Amongst other things, it emerged that the organisation of the biosphere reserve enables changes in the ecosystem to be detected and interpreted, and action to subsequently be taken where necessary. An important lesson that emerged was that there is a need for more resources and cooperation with stakeholders outside the biosphere reserve in order to address the major ecological challenges, such as the brownification of the River Helge å and the decline in the wading bird population.

2.4 Comment on the following matters of special interest in regard to this biosphere reserve:

2.4.1 Is the biosphere reserve addressed specifically in any local, regional or/and national development plan? If so, what plan(s)? Briefly describe such plans that have been completed or revised in the past 10 years.

The municipal comprehensive plan, as most recently revised in 2013, indicates that the biosphere reserve is primarily affected by aspects concerning conservation and support the planning process.

The nature conservation programme for Kristianstad Municipality was updated in 2014 with a supplementary strategy regarding the way in which the conservation work is to be carried out during the next five years. An updated environmental objectives programme with local environmental objectives was also developed during 2014. This programme included a strategy element which specifies the objectives and allocation of responsibility for various types of targeted nature and environmental activities. The Biosphere Office is included in both of the products as one of the municipal case areas with explicit responsibility for achieving a number of objectives.

The county administrative board of Skåne published an analysis in 2014 of where high natural values associated with red-listed species are concentrated in the county of Skåne. Kristianstad Municipality and Kristianstads Vattenrike Biosphere Reserve clearly emerged as one of the most species-rich areas in the county. The county administrative board has also produced a conservation strategy on the basis of the analysis, which is linked to relevant national environmental objectives and was distributed for consultation in 2014. The strategy specifies the challenges, goals and methods of the conservation work and mentions Kristianstads Vattenrike Biosphere Reserve as being an important stakeholder for conservation work in the species-rich area of north-eastern Skåne.

As part of the Swedish conservation policy at national level, the biosphere reserve has become a tool in a similar way to nature reserves and national parks, with the aim of bringing about sustainable development. The Swedish Environmental Protection Agency describes the biosphere reserves as pilot areas in which new methods and new knowledge may be tested with regard to sustainably managing the relationship between man and nature. As Kristianstads Vattenrike was the first biosphere reserve in Sweden, the success of the work relating to the reserve has been important for the further establishment of biosphere reserves in Swedish nature conservation.

2.4.2 Outcomes of management/cooperation plans of government agencies and other organizations in the biosphere reserve.

The Biosphere Office has worked with both regional and national authorities to ensure the conservation of various land areas of high value. The cooperation with the county administrative board of Skåne has resulted in two nature conservation agreements concerning sandy grassland areas with a very high natural value, and the cooperation with the county administrative board and the Swedish Environmental Protection Agency has led to the establishment of many government nature reserves in Vattenrike Biosphere Reserve.

2.4.3 Continued involvement of local people in the work of the biosphere reserve. Which communities, groups, etc, how are they involved?

The local community has been involved in the work relating to the Kristianstads Vattenrike Biosphere Reserve in various ways. For example, the Biosphere Office works with local stakeholders in connection with various projects. Besides time-specific projects, there is also a long-term cooperation with a number of landowners, including with regard to the management of wet grasslands and sandy grass lands, as well as cooperation with Kristianstad Golf Club regarding the management of the multifunctional golf course. Crane and goose management is another good example of the engagement of local nature and ornithological associations, farmers and landowners.

There is good cooperation with local teachers, other educators and pupils through the Naturum nature education activities, which facilitate the development of Kristianstads Vattenrike's activities. The visitor centre programme is developed by the Naturum Vattenriket visitor centre Reference Group on which local associations are also represented.

In addition, the local community is involved in the work relating to the biosphere ambassadors. The training of biosphere ambassadors is aimed at adults with an interest in Kristianstads Vattenrike Biosphere Reserve and our work, and 130 ambassadors have so far been trained. The task of the ambassadors is to disseminate knowledge of and generate interest in the biosphere reserve amongst colleagues, customers, friends, family and associations, thereby contributing to the support function of the biosphere reserve. In addition, committed people in the local community have formed the association 'Friends of Vattenrike' (Vattenrikets vänner) on their own initiative, which voluntarily provides and helps in seeking assistance for various projects in the biosphere reserve. As with the biosphere ambassadors, these people also generate interest in and disseminate knowledge of the area, in addition to arranging excursions to the reserve and seminars for its members. The association has 250 members.

2.4.4 Women's roles. Do women participate in community organizations and decision-making processes? Are their interests and needs given equal consideration within the biosphere reserve? What incentives or programmes are in place to encourage their representation and participation? (e.g. was a "gender impact assessment" carried out?) Are there any studies that examine a) whether men and women have different access to and control over sources of income and b) which sources of income do women control? If so, provide reference of these studies and/or a paper copy in an annex.

Sweden is considered to be one of the most equal countries in the world, where it is the norm to give equal consideration to the needs and interests of both men and women. Additionally, it is not permitted to show preferential treatment to certain people on the basis of gender in accordance with Swedish legislation.

Women have the highest level of participation in both local organisations and decision-making processes for Kristianstads Vattenrike Biosphere Reserve. Female representatives can for example be found on the Municipal Board, the county administrative board and the Consultation Group.

2.4.5 Are there any changes in the main protection regime of the core area(s) and of the buffer zone(s)?

No. *The core areas* consist of the nature reserve, Natura 2000 sites and habitat protection areas and all are protected by Swedish legislation in accordance with the Swedish Environmental Code, which entered into force on 1 January 1999 (SFS 1998:808).

The buffer zones consist of a Ramsar Convention site, areas of national interest for the purposes of nature conservation, shore protection areas, forests with nature conservation agreements, and municipally-owned or state-owned nature conservation areas with nonstatutory protection.

2.4.6 What research and monitoring activities have been undertaken in the biosphere reserve by local universities, government agencies, stakeholders and/or linked with national and international programs?

A number of monitoring and research activities have been carried out in the biosphere reserve over the past ten years. To clarify the list, the table on the following page highlights the main institutions, and the area(s) within which these institutions conduct research and/or monitoring, and whether they are part of local, regional, national and/or international programmes. Chapter 6 and question 6.2 describe in detail the main specialisations of the research and monitoring.

Overview of the main institutions conducting research and/or monitoring in the biosphere reserve and their specialist areas. It must be added that only the programmes which concern the biosphere activity have been included.

| Body | Activity | Specialisation | Programme | Comments |
|--|-------------------------|--|------------------|--|
| Swedish Environmental Protection Agency | Research and monitoring | Coordinates all environmental monitoring in Sweden. Provides funding for and orders research. | National | |
| Swedish Agency for Marine and Water Management | Research and monitoring | Coordinates environmental monitoring for marine and water environments in Sweden. | National | The Swedish Agency for Marine and Water Management has replaced the former National Board of Fisheries. |
| County Administrative Board of Skåne | Monitoring | Biotic and abiotic monitoring in accordance with a County Programme for the follow-up of the 16 environmental objectives | Regional | Some of the work carried out in the biosphere reserve takes place in consultation with the Biosphere Office |
| Kristianstad Municipality | Monitoring | Abiotic sampling Species monitoring and inventories Socio-economic inventories | Local | Some of the work carried out in the biosphere reserve takes place in consultation with the Biosphere Office |
| Biosphere Office | Monitoring | Species and nature inventories Survey and eel fishing, etc. | Local | |
| Committee for coordinated control of the River Helge å (Kommittén för samordnad kontroll av Helge å) | Monitoring | Recipient control of the River Helge å | Regional | A cooperation between the municipalities concerned and the county administrative boards in the counties of Skåne, Kronoberg and Jönköping, the Swedish Forestry Agency and operators |
| Western Hanöbukten Bay Water Conservation Association (Vattenvårdsförbundet för västra Hanöbukten) | Monitoring | Abiotic and biotic monitoring in the Hanöbukten bay area Clarifying the effect of emissions and the ecological status | Regional | A cooperation between seven municipalities, a port, a regiment, industries and other water conservation associations |
| Swedish Meteorological and Hydrological Institute(SMHI) | Monitoring | Weather measurements Water flow measurements Carbon dioxide emission measurements | National | |
| Bird Society of North- | Monitoring | Bird inventories and estimates | Local | Some of the work |

| | | | | |
|--|----------|---|-----------------------------------|--|
| East Scania (Nordöstra Skånes Fågelklubb) | | | | carried out in the biosphere reserve takes place in consultation with or at the request of the Biosphere Office |
| Kristianstad University - Man and the Biosphere Health (MABH) research environment | Research | Bird and evolution ecology Ecological immunology Social ecology Health-related microbiology Water conservation and biogas, etc. | Local, regional and international | The multidisciplinary MABH research environment was established at the time the Kristianstads Vattenrike Biosphere Reserve was created |
| Stockholm Resilience Centre (SRC) – part of Stockholm University | Research | Social ecology Resilience analysis Ecosystem services | National and international | Formerly the Centre for Transdisciplinary Environmental Research (CTM) (Center för Tvärvetenskaplig Miljöforskning) |

2.4.7 How have collective capacities for the overall governance of the biosphere reserve (e.g. organization of new networks of cooperation, partnerships) been strengthened?

Continuing good cooperation between various stakeholders has strengthened the management of the biosphere reserve as a whole. Since nomination in 2005, a closer cooperation has been developed between various administrations in Kristianstad Municipality and the Biosphere Office. For example, a representative from the Biosphere Office participates in the periodic planning consultation conducted by the Kristianstad City Planning Administration. In this way, knowledge relating to natural values and recreational interest can be disseminated at an early stage in the process and with a better outcome as a consequence.

The cooperation with the county administrative board and the Consultation Group continues to be excellent, benefiting the work being carried out in the biosphere reserve. The number of stakeholders participating in the Consultation Group has increased, which means that more people are involved in the work relating to the biosphere reserve. The Biosphere Office is represented in the county administrative board's Consultation Group for nature conservation in Skåne.

By employing a limnologist at the Biosphere Office, the network relating to water-related issues has been strengthened, e.g. with the Swedish Agency for Marine and Water Management and limnologists and marine biologists at Lund University. This has helped to develop the organisation which is now carrying out a number of projects associated with limnetic and marine environments in the biosphere reserve.

2.4.8. Please provide some additional information about the interaction between the three zones.

As mentioned previously under question 2.4.5, all the core areas are protected in accordance with Swedish legislation, as are many of the areas that are classified as buffer zones. The zoning has not changed over the past ten years, and the areas covered by the various zones remain the same as at the time of the application. However, the zoning itself has not generated changes in land use, but rather the biosphere activity as a whole. Amongst other things, there have been several voluntary undertakings in the buffer zones in order to strengthen the core areas, such as the development of the multifunctional golf course in Åhus (see question 4.3 for details). In addition, new nature reserves have been created in the buffer and development zones, which are not part of the core areas, but part of the biospheric work towards sustainable development.

2.4.9 Participation of young people. How were young people involved in the organizations and community decision-making processes? How were their interests and needs considered within the biosphere reserve? What are the incentives or programs in place to encourage their participation?

A number of activities come under the biosphere activities that are aimed at children, young people and young adults. The Naturum Vattenriket visitor centre programme and its various activities are aimed at all ages, although several programme items have been specifically designed for children and young people. Visits from school classes are an important aspect of the visitor centre's activities. A full-time nature educator meets the needs of schools and the desire for educational nature activities, and teaches approximately 100 classes per year.

A biosphere camp for schoolchildren aged 10-14 is arranged each year during the pupils' summer holidays. The camp is run by young people aged 16-17 working during the holidays. The camp provides an opportunity for children to learn more about man and nature and about the biosphere reserve, and also offers a chance for young people to take part in the biosphere activity by working as a camp leader.

The Biosphere Office also takes on trainees at various educational levels and offers students assistance with dissertations.

Children and young people are also welcome to contact us via the Kristianstads Vattenrike Biosphere Reserve website, and the Biosphere Office has a positive attitude towards new proposals and ideas as to how Kristianstads Vattenrike's activities can be developed to cater for the interests and needs of young people.



Photo: Karin Magntorn

Naturum Vattenriket – Biosphere Reserve visitor centre attracts people from near and far

Naturum Vattenriket serves as both a visitor centre and a meeting place for Kristianstads Vattenrike Biosphere Reserve and forms an important part of the Biosphere Office's work. Since it opened in 2010, Naturum Vattenriket visitor centre has welcomed more than 500,000 visitors. The building, with its associated exhibitions, auditorium and restaurant, is situated in the wetlands beside the River Helge å close to the city of Kristianstad. This gives visitors a starting point

full of experiences before they head out into the biosphere reserve. The exhibition informs people about both the wonderful nature and biosphere activities. The programme interweaves nature activities with literature, film, poetry, history and music.

At the same time, the visitor centre is also a meeting place for associations, companies, institutions and others involved in the work relating to the biosphere reserve.

3. ECOSYSTEM SERVICES

3.1 If possible, provide an update in the ecosystem services provided by each ecosystem of the biosphere reserve and the beneficiaries of these services.

(As per previous report and with reference to the Millennium Ecosystem Assessment Framework and The Economics of Ecosystems and Biodiversity (TEEB) Framework (<http://millenniumassessment.org/en/Framework.html> and <http://www.teebweb.org/publications/teeb-study-reports/foundations/>)).

Ecosystem services are products and services that directly or indirectly benefit people and that are important for our well-being. According to the MEA and TEEB frameworks, these services can be divided into four categories:

1. *Supporting services* – the natural processes and conditions forming the basic preconditions for all other ecosystem services.
2. *Regulating services* – benefits obtained from the regulation of natural processes.
3. *Provisioning services* – various products obtained from ecosystems.
4. *Cultural services* – non-material benefits that people obtain from ecosystems, such as mental and physical health, recreation and spiritual and aesthetic experiences.

The following is an account of ecosystem services based on these four categories for the seven most important habitats in the Biosphere Reserve in accordance with the application submitted to UNESCO in 2005. These are: 1) lakes and watercourses, 2) grazing land and hay meadows, 3) forests, 4) coastal ecosystems, 5) marine ecosystems, 6) cultivated land, and 7) urban areas. As a comprehensive ecosystem analysis has not been performed for the Biosphere Reserve or for each individual habitat, the summary is based on consultation with experts with local knowledge of the natural processes that can provide services in the various habitats/ecosystems and what the benefits are. This was subsequently compared and supplemented with the overarching existing knowledge of ecosystem services in Sweden. It was also possible to supplement the analysis of seasonally inundated grassland under the category of grazing land and hay meadows with information from a pilot study under the ecosystem service analysis performed by Nekoro and Svedén (2009) on behalf of the Biosphere Office.

It must also be added that many services are general in nature and recur under a number of different ecosystems. These services are therefore not described in detail. For example, supporting services such as the primary production of plants (the conversion of energy into organic material through photosynthesis) and biogeochemical cycles (e.g. the carbon, nitrogen and water cycles) represent basic prerequisites for all ecosystems. Biodiversity is important for the functioning of ecosystems and consequently their capacity to provide ecosystem services. Additionally, no description is given of the link between supporting services and the beneficiaries, as the supporting services are indirectly beneficial in that they underpin other ecosystem services.

The categorisation of people who benefit is not comprehensive but is based on the primary benefits and the beneficiaries. The various categories are also aimed at how the service is used or perceived. It is therefore possible to belong to several groups, e.g. a fisherman benefits from the provisioning service 'food from freshwater organisms' in his roles as an angler,

commercial fisherman and/or consumer depending on the situation. The grouping is somewhat arbitrary as no overarching study of the Biosphere Reserve's ecosystem services has been conducted. The aim is rather to obtain a simple and clear way to describe the groups of people that benefit from the various services. In cases where it is difficult to identify a specific group of beneficiaries, or where there are a number of beneficiaries, the term 'local residents' has been used as a general term for people living in Kristianstad Municipality, along with the term 'tourists' for people visiting the area. The concept of 'local and non-local residents' defines services that may be considered as important within a broader perspective (climate regulation and air purification), and similarly the concept of 'beneficiaries of the Baltic Sea' as regards water purification as part of a much larger catchment area.

Lakes and watercourses

| Ecosystem services | | Examples of people who benefit |
|--|--|---|
| Supporting services Habitats and living environments Primary production Biogeochemical cycles Nutrient flows Water flows Biodiversity | Regulating services 1. Water regulation 2. Water purification 3. Climate regulation 4. Erosion control | 1. Local residents 2. Beneficiaries of the Baltic Sea, local residents, industries 3. Local residents, local and non-local residents 4. Local residents |
| | Provisioning services 1. Drinking water for livestock 2. Irrigation 3. Food from freshwater organisms 4. Hydropower 5. Industrial cooling water | 1. Farmers 2. Farmers 3. Consumers, commercial fishermen, anglers 4. Energy companies, private use 5. Industries |
| | Cultural services 1. Recreation, outdoor recreation and tourism 2. Mental and physical health 3. Cultural and natural heritage 4. Knowledge and education | 1. Local residents, tourists and anglers 2. Local residents 3. EU, national and local residents, tourists 4. Schoolchildren, teachers, researchers, students |

There is a diverse range of aquatic environments in Kristianstads Vattenrike Biosphere Reserve. The River Helge å, which flows calmly across the Kristianstad plain, is the largest watercourse and passes the two floodplain lakes of Lake Araslövssjön and Lake Hammarsjön on its way to the sea. The water from Lake Råbelövssjön drains into the River Helge å via Nosabykanalen. The small watercourse from the Linderödsåsen Ridge races down the slope of the ridge before becoming a gently flowing watercourse on the plains before discharging into the River Helge å. The primary production of the aquatic vegetation and algae is an important supporting service from the lakes and watercourses, as this forms the basis for the limnological food chain. This also contributes to the regulating services in the form of water purification and climate regulation because nutrients and carbon dioxide are absorbed. Historically, the watercourse acted as a recipient for large quantities of untreated municipal and industrial wastewater. This wastewater is now fed into a treatment plant with a high level of purification. However, the watercourses are still subject to agricultural discharges and discharges from individual wastewater outlets. Underwater plants and trees and other vegetation in the shore zones regulate the flow of water and prevent erosion due to the fact that their roots bind the sediment together.

The primary provisioning service from this ecosystem has historically been as a power source for mills and power plants, and as a water source for households, agriculture and industries.

The majority of water extraction for industry, drinking water and irrigation now comes from groundwater reservoirs. There are still hydropower plants in the area, and the electricity generated from the water may be defined as a provisioning service. There are fish in the lakes and watercourses, although fishing now primarily takes place for private consumption.

The lakes and watercourses provide several cultural services. These are used for recreation such as canoeing, sailing, bathing, birdwatching and angling, which has also led to the improved mental and physical health of local residents. Additionally, the lakes and watercourses also attract tourists, and there are local businesses, which, amongst other things, provide boat trips and guided tours along the River Helge å, in addition to specially designed fishing trips in the area. The lakes have a high species diversity and contain several rare or endangered species, which contributes to an important natural heritage. For example, the lower water area of the River Helge å is one of the few rivers in Sweden to still have a viable European catfish population. The water and landscape in the vicinity of the lakes and watercourses in the Biosphere Reserve contribute to a local identity and sense of place.

Grazing land and hay meadows

| Ecosystem services | | Examples of who benefits |
|--|--|---|
| Supporting services Primary production Biogeochemical cycles Nutrient flows Water flows Soil formation Habitats and living environments Biodiversity | Regulating services 1. Water regulation 2. Water purification 3. Climate regulation 4. Air purification 5. Pollination | 1. Local residents, farmers 2. Beneficiaries of the Baltic Sea, local residents 3. Local residents, local and non-local residents 4. Local residents, local and non-local residents 5. Farmers |
| | Provisioning services 1. Beef 2. Feed 3. Manure 4. Drinking water 5. Mushrooms and berries 6. Wild game | 1. Farmers, consumers both in and outside the municipality 2. Farmers 3. Farmers 4. Local residents 5. Mushroom and berry pickers 6. Hunters, consumers |
| | Cultural services 1. Recreation, outdoor recreation and tourism 2. Mental and physical health 3. Cultural and natural heritage 4. Sense of place 5. Aesthetics and inspiration 6. Knowledge and education | 1. Local residents, tourists, bird watchers, hunters 2. Local residents 3. EU, national and local residents, tourists 4. Local residents 5. Local residents, cultural practitioners 6. Schoolchildren, teachers, researchers, students |

The grazing areas in the Biosphere Reserve range from dry and poor sandy heaths to healthy and wet grasslands (so-called 'seasonally inundated grasslands'). The grazing areas are dependent on grazing or mowing in order to retain their function and natural values. Mowing for hay production primarily takes place on the seasonally inundated grassland. The supporting services are largely identical for all grazing areas, as are the regulating services. However, the wet seasonally inundated grasslands contribute to water purification and regulation of the recurring floods in the water system. The seasonally inundated grasslands

absorb water and take up nutrients and act as a buffer, which reduces the risk of flooding in urban areas and prevents nutrient leakage into nearby watercourses (Nekoro and Svedén 2009).

The seasonally inundated grasslands also take up surface water through infiltration and reduce the risk of flooding in urban areas and prevent nutrient leakage into nearby watercourses (Nekoro och Svedén 2009).

In terms of provisioning services, all grazing areas contribute in the production of beef on account of the grazing provided. Animal feed for the winter months is also obtained through cutting of the seasonally inundated grasslands. In terms of cultural services, grazing areas that are easily accessible to the public also provide the potential for recreation and outdoor recreation. The bird life of the seasonally inundated grasslands mean that they are popular and well-known environments for birdwatching.

Many of the natural grasslands in the Biosphere Reserve are situated on calcareous soil, which means that many of them have a very rich flora and fauna. Wild bees are present in considerable numbers, which contributes to the pollination of both wild and cultivated plants. The sandy soil has its own characteristic plants which have a long history in the landscape and contribute to the local identity.

All grazing areas are also important pieces of cultural heritage because they form part of the traditional agricultural landscape. In this way, they also help to preserve the landscape's local identity and sense of place. The management of the grazing areas through cutting and grazing also preserves traditional and local ecological knowledge (Nekoro och Svedén 2009). This management, along with the high natural value of the grazing areas, also helps to allow the area to be used for educational purposes, ranging from teaching younger children about nature to education and research at a higher level.

Forests

| Ecosystem services | | Examples of who benefits |
|---|---|---|
| Supporting services Primary production Biogeochemical cycles Nutrient flows Water flows Fertility of the land, soil formation Habitats and living environments Biodiversity Seed dispersal | Regulating services 1. Water regulation and purification 2. Climate regulation 3. Air purification 4. Erosion control 5. Biological pest control 6. Prevention of storm damage | 1. Beneficiaries of the Baltic Sea, local residents 2. Local residents, local and non-local residents 3. Local residents, local and non-local residents 4. Local residents, forest owners, other landowners 5. Forest owners 6. Forest owners, farmers, homeowners |
| | Provisioning services 1. Timber, wood and decorative materials 2. Biofuel (wood and wood chips) 3. Drinking water 4. Wild game 5. Mushrooms and berries | 1. Forest owners and companies in the sector 2. Local residents 3. Local residents 4. Hunters, consumers 5. Local residents, mushroom and berry pickers |

| | | |
|--|---|--|
| | Cultural services <ol style="list-style-type: none"> 1. Recreation, outdoor recreation and tourism 2. Mental and physical health 3. Cultural and natural heritage 4. Sense of place 5. Aesthetics and inspiration 6. Knowledge and education | <ol style="list-style-type: none"> 1. Local residents, tourists, bird watchers 2. Local residents 3. EU, national and local residents, tourists 4. Local residents 5. Local residents, cultural practitioners 6. Schoolchildren, teachers, researchers, students |
|--|---|--|

The Biosphere Reserve contains deciduous forests, moist alder forest, mixed forest and coniferous forest. The largest forest areas are located in the bedrock areas of the Linderödsåsen Ridge and the Nävlingeåsen Ridge in the south-west and Balsberget in the north, while smaller areas are scattered across the plains and in the form of pine plantations along the coast (described under coastal ecosystems). Biogeochemical cycles and soil fertility may be considered as some of the most important supporting services, as they create the conditions necessary for the forest's production. For example, the trees absorb nutrients and water from the ground, which also provides a foothold for tree roots. In this way, the land supports regulating services such as climate regulation through the storage of carbon in the soil and the regulation of water flow, in addition to provisioning services such as timber production, biofuels and drinking water (Swedish Environmental Research Institute (IVL) 2014).

Excluding forestry, the most important provisioning services are timber, wood, biofuels and decorative materials. The provisioning services provided by forests to the public and hunters are mushrooms, berries and wild game. Drinking water is another important provisioning service provided by woodland areas. Forests both capture and store water by a process of infiltration into groundwater reserves, in addition to purifying the water to remove pollutants (IVL 2014). However, in the Kristianstads Vattenrike Biosphere Reserve, the contribution to groundwater via infiltration is greater from arable and grazing land because the Biosphere Reserve largely consists of these land types.

The forests provide important cultural services. They are used for outdoor recreation and exercise in the form of forest walks, orienteering and mushroom- and berry-picking, which means that they contribute to both physical and mental health. It is possible that protected forests in the nature reserve provide a value that is somewhat greater in terms of these aspects, as many of them are more accessible as a result of visitor facilities such as parking, in addition to a greater number of larger paths. The protected pine and hardwood forests typically provide greater variety and species diversity than production-oriented spruce forests. Beech forests in particular attract visitors, as these are easy to navigate, light and considered by many people to be particularly beautiful.

Coastal ecosystems

| Ecosystem services | | Examples of people who benefit |
|---|---|---|
| Supporting services <ul style="list-style-type: none"> • Primary production • Biogeochemical cycles • Nutrient flows • Water flows • Supply of sand • Habitats and living environments • Biodiversity | Regulating services <ol style="list-style-type: none"> 1. Climate regulation 2. Water purification 3. Erosion control 4. Storm, wind and surge protection 5. Pollination | <ol style="list-style-type: none"> 1. Local residents, local and non-local residents 2. Beneficiaries of the Baltic Sea, local residents 3. Local residents 4. Local residents 5. Local residents, farmers |
| | Provisioning services <ol style="list-style-type: none"> 1. Forest timber 2. Mushrooms and berries | <ol style="list-style-type: none"> 1. Landowners 2. Local residents, mushroom and berry pickers |
| | Cultural services <ol style="list-style-type: none"> 1. Recreation and tourism 2. Mental and physical health 3. Cultural and natural heritage 4. Sense of place 5. Aesthetics and inspiration 6. Knowledge and education | <ol style="list-style-type: none"> 1. Local residents, tourists, bird watchers, anglers 2. Local residents 3. EU, national and local residents, tourists 4. Local residents 5. Local residents, cultural practitioners 6. Schoolchildren, teachers, researchers, students, armed forces |

The coastal ecosystem in the Kristianstads Vattenrike Biosphere Reserve is characterised by sandy beaches, dunes, pine forests and drift sand fields. The dune landscape provides a natural buffer against high waves and storms, and the vegetation in these ecosystems contributes by preventing erosion and sand drift, and the forest provides shelter for coastal urban areas and the agricultural landscape, which are all important regulating services.

The provisioning services for the coastal ecosystem are limited to forest timber and mushrooms and berries. However, the coastal ecosystem contributes with many cultural services. These areas are popular with local residents, summer residents and tourists because of their beautiful and easily accessible environments and their recreational and outdoor recreation possibilities such as enjoying the sun, bathing, walking, fishing and birdwatching. These services are in turn dependent on the biodiversity that the coastal ecosystem provides, particularly special flora and bird fauna.

Eel fishing is still carried out along the Vattenrike coast, but is now only carried out to a limited extent due to the endangered status of the eels. The activity of eel fishermen forms part of an important cultural and historical heritage. The fact that the activity is still performed in the areas around Ålabodarna also contributes to the conservation of species-rich sand environments, as many of these species are dependent on periodic ground disturbance.

Education and teaching people about nature are also cultural services provided by coastal ecosystems, as these areas are often used by schools for excursions. One of the armed forces' large exercise areas at the Rinkaby firing range is located on the coast and used for training and exercises. The field is open to the public as a recreation area when it is not in use. The military activity also contributes to biodiversity as a result of the periodic disturbance of the sandy soils in the exercise area.

Marine ecosystems

| Ecosystem services | | Examples of who benefits |
|--|---|---|
| Supporting services Habitats and living environments Primary production Biogeochemical cycles Nutrient flows Water flows Biodiversity | Regulating services 1. Water regulation 2. Water purification: uptake/dilution 3. Climate regulation 4. Supply of sand 5. Erosion control 6. Wave control | 1. Local residents 2. Beneficiaries of the Baltic Sea, local residents 3. Local residents, local and non-local residents 4. Local residents 5. Local residents 6. Local residents |
| | Provisioning services 1. Food from fish | 1. Commercial fishermen and anglers, consumers |
| | Cultural services 1. Recreation, outdoor recreation and tourism 2. Mental and physical health 3. Sense of place 4. Cultural and natural heritage 5. Knowledge and education | 1. Local residents, tourists, anglers, divers, boat owners 2. Local residents, people living on the coast, tourists 3. Local residents, people living on the coast 4. EU, national and local residents, eel fishermen, 5. Schoolchildren, teachers, researchers, students |

The marine ecosystem in the Kristianstads Vattenrike Biosphere Reserve is located at Västra Hanöbukten, which is part of the Baltic Sea. A number of areas with valuable natural environments were documented in an inventory of coastal areas performed in 2014, particularly soft seabeds with eelgrass beds and boulder-strewn seabed areas with macroalgae and bladderwrack. These areas provide important supporting services such as habitats, living environments and primary production, and contribute to biodiversity. Seabeds containing eelgrass and macroalgae support robust fish populations, as they provide protection, spawning and breeding grounds for many species of fish. In turn, these areas act as a food resource, which is a contributory factor behind the rich bird life in the coastal area. As the eelgrass binds the bottom sediment and the meadows absorb wave energy, the areas also provide a regulating service in the form of erosion control. The plants absorb carbon dioxide and therefore also act as carbon sinks.

Phytoplankton, seagrass and macroalgae are the main primary producers in marine ecosystems and form the basis for the marine food chain. By absorbing carbon dioxide, the areas also regulate and reduce human impact on the climate, which benefits society as a whole and not merely the local residents in Kristianstad.

Food from fish represents the primary provisioning service from the marine ecosystem in the Biosphere Reserve. Eel fishing continues to be carried out here, albeit in restricted form, as it can only be carried out by special permit holders following the introduction of a general ban on eel fishing in 2007 (HaV 2014). The cultural history associated with eels fishing is important in terms of local identity. The marine ecosystem also provides other cultural services, such as recreation and tourism, because users of the area include anglers and recreational divers, in addition to boat owners and bathers. Furthermore, the marine area

contributes to a sense of place and is used for educational purposes to teach schoolchildren about nature and for research and teaching at university level.

Agricultural land

| Ecosystem services | | Examples of who benefits |
|--|---|---|
| Supporting services Primary production Biogeochemical cycles Nutrient flows Water flows Soil formation Habitats and living environments Biodiversity | Regulating services 1. Climate regulation 2. Air purification 3. Biological pest control 4. Pollination | 1. Local residents, local and non-local residents 2. Local residents, local and non-local residents 3. Farmers 4. Farmers |
| | Provisioning services 1. Food from the plant kingdom 2. Animal feed 3. Meat and milk products 4. Game | 1. Farmers, consumers 2. Farmers and other livestock owners 3. Farmers, consumers 4. Hunters, consumers |
| | Cultural services 1. Recreation and tourism 2. Cultural and natural heritage 3. Sense of place 4. Aesthetics and inspiration 5. Knowledge and education | 1. Local residents, tourists, bird watchers, hunters 2. EU, national and local residents, farmers, tourists 3. Local residents, farmers 4. Local residents, cultural practitioners 5. Schoolchildren, teachers, researchers, students |

The open cultivated landscape is characteristic of Skåne. This also applies to the Biosphere Reserve, in which arable land represents a dominant part of this landscape. Grasslands, wooded environments and various types of microhabitats are key elements of the agricultural landscape. These are natural structures with a long history in the landscape. Many species-rich environments can be found here with links to long and traditional extensive use. The supporting services, which are important primarily for the production of food, are the primary production of plants and photosynthesis, the biogeochemical cycles, soil formation and the natural supply of water from groundwater reserves and nearby watercourses. Pollination primarily performed by bumblebees and other wild bees represents an important regulating service for the cultivation of non-wind pollinated crops such as rapeseed and fruit and berry crops. Biological pest control can also be considered as another important regulating service, particularly in connection with organic agriculture where little or no chemical pesticides may be used (Swedish Environmental Protection Agency 2012).

Food from cereals, vegetables, fruit and berries and cattle represent the dominating provisioning services. Many locally produced products from agriculture are consumed in Kristianstad Municipality. Substantial regional and national exports also take place, which increases the extent of these services.

The cultural services are primarily related to the open landscape which characterises the Biosphere Reserve and which represents a piece of cultural heritage because the land has been used since prehistoric times. This also gives rise to a sense of place. The agricultural landscape offers recreational opportunities, both directly in the form of hunting and riding for example, and indirectly in the form of the beauty experienced by people travelling through the landscape. The local food production contributes to the tourist industry, for example by

enhancing visitor experiences through the range of locally produced food characteristic of the area such as ice cream and other dairy products, processed products made from apples and berries and wild game.

Urban areas

| Ecosystem services | | Examples of who benefits |
|--|---|---|
| Supporting services Primary production Biogeochemical cycles Nutrient flows Water flows Soil formation Habitats and living environments Biodiversity | Regulating services 1. Water purification and regulation 2. Climate regulation 3. Air purification 4. Erosion control 5. Pollination 6. Biological pest control | 1. Beneficiaries of the Baltic Sea, local residents 2. Local residents, local and non-local residents 3. Local residents, local and non-local residents 4. Local residents 5. Local residents 6. Local residents |
| | Provisioning services 1. Vegetables | 1. Local residents |
| | Cultural services 1. Recreation and tourism 2. Physical and psychological health 3. Cultural and natural heritage 4. Sense of place 5. Aesthetics and inspiration 6. Knowledge and education | 1. Local residents, tourists 2. Local residents 3. Local residents 4. Local residents 5. Local residents 6. Schoolchildren, teachers |

Urban areas also provide ecosystem services. Gardens, parks and other natural/green areas with elements of open water in urban areas provide habitats for flora and fauna, which benefits both urban residents and other local residents. For example, flowers grown in gardens and on balconies provide habitats for wild bees, which in turn provide pollination. Among other things, trees in urban areas are important habitats for insects and birds. They also purify the air by absorbing particles and are responsible for climate regulation because they provide shade and absorb carbon dioxide. Another important ecosystem service in urban areas is the regulation and purification of water. Vegetation such as grass and trees take up water and surfaces consisting of gravel or soil allow water to permeate, which, among other things, reduces the need to divert surface water.

Ecosystems in urban areas also account for provisioning services such as vegetables cultivated in gardens or parks. An example of this is the vegetables cultivated in Hälsosträdgården in Kristianstad. Parks and gardens also account for many cultural services. Urban residents and visitors use parks and green areas for recreation and exercise, which improves both physical and mental health. Studies have shown that greenery has a calming effect on people and can reduce stress levels.

3.2 Specify if there are any changes regarding the indicators of ecosystem services that are being used to evaluate the three functions (conservation, development and logistic) of the biosphere reserve. If yes, which ones and give details and update.

No previous indicators exist of ecosystem services in the Kristianstads Vattenrike Biosphere Reserve to refer to, as no comprehensive analysis of the entire Biosphere Reserve's ecosystem services has so far been carried out.

3.3 Update description on biodiversity involved in the provision of ecosystems services in the biosphere reserve (e.g. species or groups of species involved).

Biodiversity of flora and fauna is often a prerequisite for an ecosystem to provide important ecosystem services. The importance of different species varies depending on the function that they perform in the ecosystem, e.g. whether they pollinate flowers or act as apex predators, and how important they are in this context. The table below presents the key species or groups of species of particular importance for the respective ecosystem service in the Biosphere Reserve. However, it is important to note that it is the high biodiversity of the area overall that makes Kristianstads Vattenrike unique, and in many cases the diversity contributes to the ecosystem services. Additionally, a high species diversity often contributes to the resilience of an ecosystem, i.e. its ability to handle stress as a result of human influence and natural disturbance. In cases where several species can generate the same function and service, these can replace each other in the event of changes in species content.

As for question 3.1, these tables are not based on any studies of ecosystem services in the area, but have been produced in consultation with experts with local knowledge of the Biosphere Reserve's ecosystem and important species and species groups.

Overview of the supporting and regulating ecosystem services and the species and/or species groups of importance for provision of the service.

| Ecosystem services | Species and species groups |
|--|---|
| Supporting services | |
| <i>Primary production</i> - Conversion of solar energy into organic material through photosynthesis. | Ground vegetation, e.g. herbs, grasses and cultivated crops Coniferous trees, e.g. pine and spruce Deciduous trees, e.g. birch, alder, oak and beech Freshwater algae and other underwater vegetation Marine algae and other underwater vegetation, e.g. eelgrass, bladderwrack and phytoplankton Microbes |
| <i>Biogeochemical cycles</i> | Microbes Mushrooms, etc. |
| <i>Habitats and living environments</i> - Species that are important for maintaining the habitat and living environments for other organisms. | Ground vegetation, e.g. flowering plants in dune areas and natural grazing land. Coniferous trees, primarily pine Deciduous trees, e.g. alder, beech and oak Eelgrass, toothed wrack and bladderwrack Fish species (e.g. pike, perch, cod) are important for maintaining living environments for other species |
| <i>Biodiversity</i> - Includes the entire species composition in the Biosphere Reserve and its genetic diversity. However, only species groups considered to be specifically species-rich for the Biosphere Reserve have been specified in the table. | Birds Insects Flowering plants Mushrooms Small and large game Bats Fish community in freshwater and marine environments |
| <i>Soil formation</i> - Organisms that contribute to the formation of new soil. | Microbes Invertebrates |
| <i>Seed dispersal</i> - Organisms responsible for seed dispersal, i.e. this does not include abiotic seed dispersal. | Birds, insects and rodents |
| Regulating services | |
| <i>Water regulation and purification</i> - Species that regulate and purify water through water uptake and the absorption of nutrients and through the regulation of water flow. | Ground and scrub vegetation Coniferous and deciduous trees (for which deciduous trees are particularly important for water regulation) Rushes and reeds Catch crops, e.g. rye Bladderwrack and eelgrass Algae and underwater vegetation in freshwater Invertebrates, e.g. mussels in freshwater and marine environments |
| <i>Climate regulation</i> - Species that contribute to climate regulation by absorbing carbon dioxide and other greenhouse gasses. | Ground and scrub vegetation Coniferous and deciduous trees Algae in freshwater and marine environments, plankton and macroalgae, eelgrass Underwater vegetation in freshwater |
| <i>Air purification</i> - Species that purify the air by absorbing airborne contaminants. | Ground and scrub vegetation Coniferous and deciduous trees |
| <i>Pollination</i> - Species that contribute to the pollination of both commercially important and naturally occurring plants. | Wild bees, diptera, butterflies and other pollinating insects. |
| <i>Erosion control</i> - Species that bind sediment through a network of roots. | Ground vegetation, primarily grasses and bushes Coniferous and deciduous trees Catch crops, e.g. rye Eel grass Underwater vegetation, bushes and eels in freshwater environments |
| <i>Biological pest control</i> - Species that provide natural pest control through predation. | Insects, birds of prey, mammals and insect eating birds |
| <i>Storm, wind and wave protection</i> - Species that reduce the negative effect of wind and/or waves. | Ground vegetation such as dune grass in coastal ecosystems Bushes, coniferous and deciduous trees Eelgrass in marine environments; Underwater vegetation and alder in freshwater environments |

Overview of the provisioning and cultural ecosystem services and the species and/or species groups of importance for provision of the service.

| Ecosystem services | Important species and species groups |
|--|---|
| Provisioning services | |
| <p><i>Drinking water</i></p> <ul style="list-style-type: none"> - <i>Species groups that are important for water purification in cases where the water becomes part of the groundwater reservoir through infiltration for use as drinking water. It may however be argued that these species contribute to the regulating service of water purification; however, we have chosen to include them in this context.</i> | <p>Ground vegetation such as various grass species and bushes (e.g. osier) Coniferous and deciduous trees Algae and underwater vegetation in freshwater Invertebrates, e.g. freshwater mussels</p> |
| <p><i>Food from the plant kingdom</i></p> <ul style="list-style-type: none"> - <i>Species that are grown for commercial purposes or for personal consumption.</i> | <p>Crops such as various types of cereals, root crops, rapeseed, fruit, berries and vegetables</p> |
| <p><i>Bi/residual products from food production from the plant kingdom</i></p> | <p>E.g. draff, beet pulp, beet shreds, potato pulp</p> |
| <p><i>Meat and milk products</i></p> <ul style="list-style-type: none"> - <i>Species that are important for the production of meat and milk products.</i> | <p>Various species of grass and herbs grazed by cattle</p> |
| <p><i>Food from fish/freshwater organisms</i></p> <ul style="list-style-type: none"> - <i>Both marine and freshwater species that are fished for commercial purposes or for personal consumption.</i> | <p>Fish species such as perch, pike, zander, cod, flounder and eel Crayfish</p> |
| <p><i>Animal feed</i></p> <ul style="list-style-type: none"> - <i>Species used for animal feed.</i> | <p>Primarily various species of grass (including maize) and legumes</p> |
| <p><i>Manure</i></p> <ul style="list-style-type: none"> - <i>Species that directly or indirectly contribute to natural fertilizers.</i> | <p>Various species of grass grazed by cattle Cattle, e.g. bovine cattle</p> |
| <p><i>Wild game</i></p> <ul style="list-style-type: none"> - <i>Species that normally serve as hunting prey. Used for personal consumption or for sale.</i> | <p>Roe deer, elk, deer, wild boar and wild geese</p> |
| <p><i>Wild mushrooms and berries</i></p> <ul style="list-style-type: none"> - <i>Edible species that are plucked, primarily for personal consumption</i> | <p>Edible mushroom and berry species, e.g. chanterelles, boletus, blueberries and raspberries</p> |
| <p><i>Timber</i></p> <ul style="list-style-type: none"> - <i>Species that are used for pulpwood and timber.</i> | <p>Spruce, pine, beech and birch</p> |
| <p><i>Biofuel (wood, wood chips)</i></p> <ul style="list-style-type: none"> - <i>Species that are used as fuel, either for commercial purposes or personal consumption.</i> | <p>Spruce, pine, beech and birch</p> |
| Cultural services | |
| <p><i>Recreation, outdoor recreation, tourism</i></p> <ul style="list-style-type: none"> - <i>Species that contribute to recreational and outdoor recreation experiences such as birdwatching and angling. This includes species that also contribute to the Biosphere Reserve's tourist industry by attracting visitors.</i> | <p>The Biosphere Reserve's biodiversity is important in itself for this service. Specific important species groups and species include:</p> <ul style="list-style-type: none"> - Birds such as cranes, ducks, geese and birds of prey that attract birdwatchers and tourists. - Fish species important for angling and recreational fishing such as pike, perch, trout and eels. - Otters and seals - Beech - Sand pink and wild thyme - Small and large game - Crops from the area that may attract tourists such as strawberries and apples. |
| <p><i>Mental/physical health</i></p> <ul style="list-style-type: none"> - <i>Species that contribute to improved physical and/or mental health in people.</i> | <p>The Biosphere Reserve's biodiversity is important in itself for this service, and this is not related to any specific species or species group. However, green spaces in general have a positive effect on both physical and mental health, particularly in urban areas where greenery in parks, gardens and allotments play an important role.</p> |
| <p><i>Cultural and natural heritage</i></p> <ul style="list-style-type: none"> - <i>Species that are important for the cultural and/or natural heritage of the Biosphere Reserve.</i> | <p>The biodiversity is important in itself for the cultural and natural heritage of the Biosphere Reserve. However, certain red list species are considered important for the natural heritage of the Biosphere Reserve, such as sheatfish, sand pink and tawny pipit, and the freshwater plants fen ragwort and river water crowfoot, and thick shelled river mussels and eels.</p> |

| | |
|---|---|
| <i>Sense of place</i> - <i>Species that contribute to a stronger sense of place in the Biosphere Reserve.</i> | The Biosphere Reserve's biodiversity is important in itself for this service, and the open landscapes of arable fields, seasonally inundated grasslands and sandy soil, along with pine forests along the coast are characteristic of the region. |
| <i>Aesthetics and inspiration</i> - <i>Species that are aesthetically appealing and help to provide inspiration, e.g. to cultural practitioners.</i> | The Biosphere Reserve's biodiversity is important in itself for this service, in addition to the open landscape together with beech and pine forests. |
| <i>Knowledge/education</i> - <i>Species that are used or referred to for educational purposes and/or contribute to maintaining ecological knowledge.</i> | The Biosphere Reserve's biodiversity is primarily important in itself for this service. Certain specific species and species groups include: sheatfish, cranes, wading birds and wild bees. |

3.4 Specify whether any recent/updated ecosystem services assessment has been done for the biosphere reserve since its nomination/last report. If yes, please specify and indicate if and how this is being used in the management plan.

An ecosystem service analysis has been performed since the nomination of the services provided by the seasonally inundated grasslands.

The philosophy behind the concept of ecosystem services is that nature's services are important for the well-being of people, and permeate the action plan for Kristianstads Vattenrike Biosphere Reserve and form a natural part of the biosphere work. In line with the increased level of attention afforded to ecosystem services at a national level, Kristianstad Municipality is working to identify the value of ecosystem services locally and to increase the knowledge base. Two major research projects linked to ecosystem services in the Biosphere Reserve have been commenced during 2014:

1. 'Ecosystem services in coastal municipalities in Skåne' (Skåne Association of Local Authorities, Kristianstad University and Stockholm University)
2. 'Managing bundles of ecosystem with multiple users in Helge å catchment' (Stockholm Resilience Centre, Stockholm University)

4. THE CONSERVATION FUNCTION

[This refers to programmes that seek to protect biodiversity at landscape and site levels and/or ecological functions that provide ecosystem goods and services in the biosphere reserve. While actions to address this function might be focused on core area(s) and buffer zone(s), ecosystem dynamics occur across a range of spatial and temporal scales throughout the biosphere reserve and beyond.]

4.1 Significant changes (if any) in the main habitat types, ecosystems, species or varieties of traditional or economic importance identified for the biosphere reserve, including natural processes or events, main human impacts, and/or relevant management practices (since the last report).

A description is provided below of the most significant changes in Kristianstads Vattenrike Biosphere Reserve since 2005 for each nature type (see chapter 3).

Lakes and watercourses

Changes to aquatic vegetation The Common clubrush (*Schoenoplectus lacustris*), which was a characteristic plant found in Lakes Hammarsjön and Araslövssjön, has declined radically over the past ten years. There has been a negative effect on bird species dependent in various ways on the Common clubrush. The Great crested grebe (*Podiceps cristatus*), the Eurasian coot (*Fulica atra*) and Black tern (*Chlidonias niger*) are examples of such birds. The decline in Common clubrush began as long ago as the turn of the century, although it was not until 2005 that the Biosphere Office began to consider the matter in earnest. Since then, the work of the Biosphere Office has focused on attempting to understand the contributory factors in order to allow measures to be implemented. For example, local historical knowledge has been gathered, aerial photographs have been studied and Kristianstad University has conducted a cage experiment to investigate how common clubrush is affected by grazing geese. A sharp rise in the population of Greylag goose (*Anser anser*) is likely to be the primary cause, although other factors may also have contributed.

Measures against brown water: During the past 30-40 years, the water in our lakes and watercourses has become increasingly brown. This is primarily due to increasing concentrations of organic matter (humus) and iron in the water. The causes are a combination of factors at both global and local level. Climate change, drainage, land use changes and a transition from broadleaf to coniferous forest are some of the likely factors involved. Amongst other things, the Biosphere Office has implemented a project relating to the Bivarödsån watercourse together with landowners in order to address brownification. The project aims to recreate wetlands in the forest landscape. The water quality is sampled continuously in several watercourses to follow the development of this.

Improved nutrient balance The excessive nutrient levels in our water are being reduced. This is primarily due to improved water purification, improved environmental legislation in recent decades and the agricultural industry taking greater responsibility for its discharges. The measures are currently not yet sufficient to restore balance in the Baltic Sea or healthy lakes and watercourses. Since the early 2000s, Swedish water has been covered by the EU Water Framework Directive concerning the good ecological status of our waters. The Biosphere Office has been working for many years on the conservation of wet grasslands beside the River Helge å, which support both water quality and biodiversity. Together with other administrations in Kristianstad Municipality, the work is continuing to reduce the supply of

nutrients entering watercourses. Many new wetlands have been created in recent years in the cultivated landscape and these remove nutrients from the water, even out water flows and promote biodiversity.



New wetlands reduce nutrient levels in Hanöbukten Bay and create ideal bird habitats

The Biosphere Office has been actively working in recent years to reduce the transport of nutrients into Hanöbukten Bay. A total of around 150 hectares of wetlands have been created alongside watercourses discharging into the River Helge å. The wetlands are beneficial for nature in a variety of ways. They purify the water by removing nutrients, even out the water flow over the course of the year and increase the potential for biodiversity.

They also act as an irrigation resource. By storing the water in winter when it is plentiful, it can then be used in the summer in dry conditions, which is beneficial for animal life, farmers and groundwater levels.

Landowners around the River Helge å have shown considerable interest, and the work will continue in cooperation with neighbouring municipalities in relation to both agricultural and forested landscapes.

Other changes

The survey fishing that took place in Lakes Hammarsjön and Råbelövssjön in 2010 indicated a good ecological status. This means that there is a good balance between fish-eating species (Perch and Pike – *Perca fluviatilis* and *Esox lucius*) and plankton-eating species (White bream, Bream and Roach - *Abramis bjoerkna*, *Abramis brama* and *Rutilus rutilus*);

The European catfish disappeared from the Lower River Helge å at the beginning of the 1960s. Sexually mature European catfish were released in 1999 in a cooperation between Kristianstads Vattenrike Biosphere Reserve and the former National Board of Fisheries. Reports from anglers some years later indicated that spontaneous spawning was taking place in the river. Survey fishing has been performed in the Lower River Helge å to measure European catfish populations every year since 2011. This indicates that there is now a viable European catfish population in the Lower River Helge å.

The Biosphere Office began to prepare an inventory of the large freshwater mussels in the River Helge å in 2014. This confirmed what had previously been suspected, which was that all seven of Sweden's large freshwater mussel species live in the River Helge å.

Salmon (*Salmo salar*) was one of the most dominant species in the River Helge å prior to 1909. Power plant construction and severe pollution wiped out the salmon population. This is now recovering as a result of the release of smolt. We hope to see more of this long-distance traveller in the River Helge å.

Grazing land and hay meadows - Wet grasslands

The restoration of wet grasslands beside the River Helge å and lakes has been successful. Large areas have been restored to a good status in cooperation with landowners and animal keepers. The bird life on the wet grassland has responded in line with the restoration with increasing populations. Unfortunately, several incidents resulting from external factors have affected the wet grasslands and, in particular, the bird life there in a negative way during the past ten-year period.

The summer floods of 2007: The water in the River Helge å rose to a maximum height of 1.84 metres above its normal level following heavy rain in July 2007. Large areas of the wet grassland were inundated by water. Many animal keepers were forced to move their animals, and it was also not possible to mow the grassland. The worst consequence was the large quantity of mud and brown coloured materials, primarily iron and humus, which was transported by the water and deposited on vast areas of the the wet grasslands. Large areas of wet forest alongside the Lower River Helge å and Lakes Hammarsjön and Araslövssjön also died as a result of the summer floods. Many farmers were hesitant about continuing with the important nature conservation work of managing the wet grasslands through grazing and mowing due to the risk of further floods and the difficulties in fulfilling the commitments under the environmental support received for the management. The Biosphere Office has contributed towards a good dialogue between the parties concerned, which has led to the farmers continuing in their management of the wet grassland.

Decline in wading birds: The number of wading birds breeding on the wet grasslands of the biosphere reserve has declined drastically during recent years. This is a result of a number of factors, ranging from local to global levels. There is a general decline in wading bird populations in north-western Europe. A decline in areas that provide a suitable habitat, predation and increasing numbers of grazing wild geese are known factors. Southern Sweden is the northernmost outpost for several species of birds, which makes them particularly sensitive. The consequences of the major floods in July 2007 are likely to have affected the sequence of events. The negative effect on invertebrate fauna is a probable factor that is now being studied. The Biosphere Office is working to improve the level of knowledge regarding the causes as a basis for implementing the correct measures to break this negative trend in cooperation with Kristianstad University, the County Administrative Board, local ornithological associations and other stakeholders in Sweden and elsewhere in Europe.

Other changes

The population of breeding and resting Greylag goose (*Anser anser*) has increased since the beginning of the 1990s. There are trends to suggest that this increase has now stopped and that the breeding population has declined somewhat.

The population of birds of prey has generally increased over a period of two decades. Amongst others, the population of Sea eagle (*Haliaeetus albicilla*) in the biosphere reserve has seen a fantastic rise, which is very positive in many ways, for example for the tourism industry in the area.

A general rise in the number of cranes has led to measures in the form of feeding in order to reduce damage to field crops. This has in turn resulted in positive effects. Visitors can experience the cranes in an attractive way at the feeding locations, both in reality and via the internet (webcam). Crane feeding takes place in cooperation with farmers, the County Administrative Board and the non-profit nature conservation organisation, with financial support from the Swedish Environmental Protection Agency and local businesses.

In recent years, the generational changeover has led to a younger generation of farmers taking over the management of the wet grasslands. There continues to be considerable interest in the work relating to the management of wet and natural grazing land and hay meadows.

The creation of many new wetlands in the biosphere reserve has been very positive for biodiversity in the reserve and will help to improve water quality in the long-term. Otters have returned to the biosphere reserve, and for example have been seen in the visitor centre lake in the centre of Kristianstad on several occasions.

Grazing land and hay meadows – sandy grasslands

Knowledge concerning the unique natural values of the sandy grasslands of the biosphere reserve has increased continuously during the past ten years. Experts on various organisms have demonstrated rich occurrences of threatened species in various inventories. The increased awareness of these unique values has highlighted the sandy grasslands in the rural and coastal landscape and consequently both the threats and the need for protection and management. Landscape analyses and historic documentation has been helpful in the strategic work in raising awareness and protecting and managing valuable sandy grasslands.

Conversion to agricultural land: The conversion of natural pastures into cultivated land has increased in the sandy grasslands around Åhus since 2005. The sandy grounds are attractive for intensive vegetable cultivation as a result of the area's favourable climate and access to groundwater for irrigation. Land that is gradually becoming overgrown with tall grass and pine trees due to the discontinuation of management in small marginal land areas is also a negative factor.

Protection and management: Extensive work has been performed by the Biosphere Office over the past ten-year period to conserve valuable sandy grasslands in the long-term. This has taken place through the establishment of nature reserves, the signing of nature conservation agreements with landowners and cooperation with various stakeholders in the landscape. Changes of routines and methods for the management of green areas and road verges and for the laying of cables on sandy grasslands has boosted biodiversity both in urban areas and in the rural landscape.

Development of best practise: Conditions for the diversity of sandy grasslands have been improved through the development of new management methods. Digging, excavation, ploughing and burning have been tested, evaluated and developed. Inventories of diversity indicate that appropriate management encourages threatened sandy soil species. Examples of species that have responded to measures include the Tawny pipit (*Anthus campestris*), Sand

pink (*Dianthus arenarius*), *Megachile lagopoda* and a number of other species of wild bees and butterflies.

Forests

Comprehensive work has been performed by the County Administrative Board in connection with the conservation of the internationally highly rated hillside forest at Linderödsåsen. Extensive areas have been protected through the establishment of reserves in cooperation with landowners. The work of the Biosphere Office has primarily consisted of highlighting these valuable areas through the provision of information and the establishment of visitor sites.

Coastal ecosystems

The coast in the biosphere reserve is dominated by sand dunes and pine forests on drift sand fields. There are areas of high natural value in both the open dune areas and in the older pine forest. The area is attractive for both residents and outdoor recreation and large areas have been built on since the mid-1900s.

Although the drifting sand fields and sandy coast largely no longer form an active part of the cultivated landscape, there is a direct link between the sandy grasslands of the cultivated landscape and the sandy coast with regard to the levels of natural value, threats and the need for protection and management.

Urban areas and infrastructure: Living close to the sea is attractive and there is a constant pressure from both developers and individuals for development of new areas. This development is regulated through the municipal planning process. A trend that is not so easy to influence is the alteration of nature plots as a result of extensions, the creation of hard surface areas and the construction of gardens. The Biosphere Office is also working to safeguard the value of sandy grasslands in the long-term in urban areas by participating in the planning process and through the provision of information and advice to property owners regarding the value and sufficient type of management of the sandy grasslands.

Development of natural and green areas: As in the rural landscape, open sandy grasslands along the coast have degenerated through gradual overgrowth which has a negative effect on biodiversity.

Active restoration and management has been executed in natural areas adjacent to residential areas along the coast. This has led to an improved biological status of valuable sandy grasslands with an increase in the presence of threatened insects and plant species such as wind flowers (*Pulsatilla pratensis*) and sand pink. Due to the closeness between the restoration- and living areas and to the information on sight and through media stressing the importance of restoration to preserve a high biodiversity, public awareness and acceptance of these actions have improved.

The Biosphere Office is during 2012-2018 participating in a national EU project called 'Sand Life', which involves the large-scale restoration of overgrown sandy areas in Natura 2000 areas in the south of Sweden (www.sandlife.se).

Marine ecosystems

The level of knowledge regarding the environmental state of the Baltic sea, and the Hanöbukten bay area in particular, is insufficient to allow us to say anything about its development over the past ten years. The Biosphere Office is the project coordinator for the project A better balance in the River Helge å and the Hanöbukten bay area (Bättre balans i Helge å och Hanöbukten) (see question 4.2). One of the aims of the project is to increase the level of knowledge regarding the natural value of the sea and to allow appropriate measures to be identified. Kristianstad Municipality will also develop an comprehensive plan for the ocean area as part of the project.

Eel fishing: The European eel (*Anguilla Anguilla*) has experienced a steady decline in all coastal areas and watercourses in Sweden. A national fishing ban on eels was introduced in 2007. Since the introduction of the ban, only existing permit holders have been permitted to fish for eel, subject to certain restrictions. The Eel Academy (Ålakademin), an association of eel fishermen, has been responsible for promoting issues concerning the negative effect of power stations and industry on eel migration routes and freshwater habitats. All the water-based activities concerned will be examined in a government study which is now under way. The Biosphere Office supports the survival of the culture of eel fishing in the biosphere reserve. There are active fishermen with an interest in eel fishing, and there is also genuine interest in safeguarding the species and the associated culture.

Agricultural land

Agriculture in Kristianstad Municipality has expanded and intensified since the Vattenrike area became a Biosphere Reserve in 2005. One of the consequences of this is that natural sandy fallow and grasslands on the Kristianstad plain has been converted to arable land. Especially for the intense cultivation of vegetables with the aid of irrigation and artificial fertiliser. Irrigation techniques have certainly become more water-efficient. However, there has also been an increase in the area of agricultural land being irrigated, which has meant that groundwater extraction has increased along with a risk of a negative effect on both the supply and quality of groundwater.

Organic agriculture has become increasingly popular, and the use of arable land for organic cultivation has almost doubled in Kristianstad Municipality during the past 10 years, with lower loads of artificial fertilisers and pesticides as a result.

Urban areas

Expansion of urban areas has taken place in the biosphere reserve over the past ten years. This has affected land with a high natural value to a certain extent. The planning process has clearly been affected as a result of the area being designated as a biosphere reserve. The biosphere reserve has been given a more prominent role in increasing knowledge in the work in connection with the comprehensive plan and in-depth comprehensive plans, and both the biosphere reserve and the fundamental ideas of a biosphere with regard to conservation and development have been highlighted in the planning work.

4.2 Describe the main conservation programmes that have been conducted in the biosphere reserve over the past ten years as well as current on-going ones. Note their main goals and the scope of activities, e.g. biotic inventories, species-at-risk, landscape analyses, conservation stewardship actions. Cross reference to other sections below where appropriate.

The conservation work in the Kristianstads Vattenrike Biosphere Reserve is performed under different theme areas in the landscape on the basis of the biosphere work's three functions: conservation, development and support. The work combines the conservation of valuable nature with the development of methods to utilise this in a sustainable manner. The work to making both nature and information concerning nature accessible to everyone is also integrated in the conservation process.

The ten theme areas in the biosphere reserve are:

1. The rich wetlands along the River Helge å
2. Tributaries of the River Helge å originating on Linderödsåsen Tidge
3. Rich woods and forests on the slopes of Linderödsåsen Ridge
4. The coastal landscape with extensive dune landscape
5. The coastal waters of Hanöbukten bay
6. Sandy grasslands formerly managed under a rotational system of cultivation and fallow
7. Balsberget Hill and Lake Råbelövssjön
8. Ancient trees and wooded habitats in cultivated areas
9. Urban natural values
10. Groundwater

Prior to the establishment of Kristianstads Vattenrike Biosphere Reserve, the conservation work primarily covered the wet grasslands which are now included in the theme area *The rich wetlands along the River Helge å*. Following designation, the work was first expanded to include the sandy agricultural land, and projects have subsequently been implemented to varying degrees in further theme areas. Actions in the biosphere reserve's most valuable areas has been prioritised and then subsequently expanded and applied in a further landscape perspective. A description is provided below of the work in the theme areas that have had the greatest focus during the past ten years. The conservation work relating to the biosphere reserve's lakes and watercourses does not constitute a separate theme area, but is instead included under several of the existing ones.

The rich wetlands along the River Helge å

The work to protect and develop the high natural values of the wet grasslands of the biosphere reserve is included in this theme area. The meadows and their natural values are dependent on recurring floods and management through grazing and mowing. Large areas of the wet grassland were becoming overgrown at the end of the 1980s and a cooperation process with land users in the area was initiated in order to preserve and expand the traditional management methods. This work was successful and the wet grasslands have been restored and their ecological status has been improved. This work has continued and developed since the designation of Kristianstads Vattenrike Biosphere Reserve. Following a devastating summer flood in 2007, considerable emphasis has been placed on increasing knowledge of the consequences of the flood. A monitoring inventory of wading birds has indicated that they avoid a number of areas that were particularly badly affected. Measures to improve the situation from a landscape perspective are under way. The work involves cooperation with local, regional and national stakeholders and authorities. Knowledge is also being exchanged with other parts of Europe in areas where a decline in the population of wading birds also has been observed.

The work to develop the value of the wet grassland has been aimed at providing the wet grassland areas with long-term protection as a nature reserve. The trust developed between the stakeholders in the restoration process has been invaluable in this context. As a result, many farmers have had a positive attitude towards the creation of a nature reserves and the ongoing management. Management resources for the nature reserves and EU agricultural aid funding have contributed to a more secure existence in the long-term for farmers who have invested time and money in the management of the wet grasslands. In this way, the biosphere activities have helped to allow farmers to continue mowing and grazing and have also created better conditions for conserving and developing the values of the wet grasslands. The work is a good example of how the biosphere activities integrate conservation measures with utilisation that promotes the sustainable use of nature.



Photo: Sussie Söderlundh

Feeding cranes at Pulken reduces damage caused to farmland and allows people to watch the cranes dancing at close quarters

Cranes (*Grus grus*) particularly like newly sown corn and wheat. This can result in substantial damage to spring crops. The Biosphere Office has been working with farmers, the Bird Society of North-East Scania (Nordöstra Skånes Fågelklubb) and the County Administrative Board to reduce the damage since 1997.

The Crane Group feed the cranes with corn in a separate field at Pulken Outdoor Museum in cases where the arrival of the birds coincides with spring planting undertaken by farmers.

This minimises the damage caused to newly planted arable fields and allows the cranes to feed undisturbed. The cranes are a great attraction to everyone interested in birds, who can enjoy the cranes from the outdoor museum. Tourists and birdwatchers have helped provide a source of revenue for the tourism industry. The birdwatching tower at Pulken Outdoor Museum has been adapted for wheelchair users, and in 2014, the Biosphere Office created a new exhibition on the cranes and the history of the site.

Other examples of projects that have been implemented or are ongoing:

1. ***Activities relating to cranes:*** The Biosphere Office has been working with farmers, the Bird Society of North-East Scania (Nordöstra Skånes Fågelklubb) and the County Administrative Board in a collaboration called the “Crane group” to reduce damage caused by cranes to spring planting since 1997. Every year, thousands of cranes use the area adjacent to the Pulken outdoor museum as a resting and roosting area. The cranes are fed with barley in an adjacent field to the outdoor museum in cases where the arrival of the birds coincides with spring planting undertaken by farmers. This minimises damage to newly planted arable fields. The cranes at Pulken attract tourists and people interested in birds and have helped to provide a recurring source of revenue for the tourism industry.
2. ***Goose management:*** Management to address the large number of breeding and resting geese has been developed. The work is being led by the County Administrative Board, is being carried out in cooperation with local and regional stakeholders and is receiving financial support from the Swedish Environmental Protection Agency. The management includes monitoring and various forms of damage prevention. A resource

person was linked to the activities during 2004 and has continued the task of supporting farmers with damage prevention measures against geese.

The coastal landscape with extensive sand dunes

The sandy grasslands of the rural landscape are along the coast turned into a sandy landscape with long unbroken sandy beaches and dune areas with pine forest planted to prevent sand drift. The area offers high recreational values and the various natural sandy environments provide important habitats for several rare species.

The Biosphere Office is participating in the EU project 'Sand Life' (2012-2018), in which valuable sandy areas are being restored in Natura 2000 areas. The work is being carried out in cooperation with the County Administrative Board of Skåne and the Swedish Armed Forces, amongst others. The project includes the Rinkaby military exercise field in the Kristianstads Vattenrike Biosphere Reserve. The field is located on sandy and calcareous ground with open grazing land and wooded sand dunes. Its biological value is now being threatened by a risk of becoming overgrown and from the leaching of lime. Restoration measures commenced in autumn 2014, and the target is to restore the area with open calcareous sand and to open up overgrown sand dune areas. The aim of the measures is to create favourable conditions for a number of threatened species that depend on these environments. Lime-dependent plants and the unique insect life of the sandy grasslands are especially important. An information point relating to the value and history of the sandy grasslands has been created at the Rinkaby field as part of the project.

Restoration of sandy grasslands close to urban areas has been completed in areas of coastal dunes and heathland in a project under the direction of the Biosphere Office. Monitoring has indicated that the measures have provided good results for threatened species. The project has raised public awareness and acceptance of the measures through guidings and signs on sight.

The coastal waters of Hanöbukten bay

The work relating to this theme area commenced in 2014. The Biosphere Office is the coordinator for the project *A better balance in the River Helge å and the Hanöbukten bay area*. The project will take place during the period 2014-2018, and is a cooperation between Kristianstad Municipality and the County Administrative Board of Skåne, with financing from the Swedish Agency for Marine and Water Management. The project work can be divided into three main areas: conserving biodiversity, reducing eutrophication and reducing brownification in the River Helge å and the Hanöbukten bay area. An inventory concerning eelgrass and bottom fauna in the Western Hanöbukten bay area was initiated during the summer of 2014. The inventories will form the basis for the municipality's ocean plan, which will supplement the applicable comprehensive plan. The project will also include survey fishing in the Hanöbukten bay area, measures to promote threatened species, the recreation of free migration routes and spawning beds in the River Vramsån for salmon and measures to reduce nutrient leaching and brownification.

Sandy grasslands

The sandy and often calciferous grasslands in Kristianstads Vattenrike Biosphere Reserve comprises a unique flora and insect and bird fauna that is valuable from both a national and international perspective. These areas are also part of an ancient cultural landscape where extensive grasslands have been used both for grazing and extensive cultivation using the rotation system of cultivation and fallow. The natural conditions in the area gave rise to this special type of landscape. The work with this theme area was commenced in 2005 in connection with the establishment of Kristianstads Vattenrike Biosphere Reserve with the aim to preserve and develop the high biodiversity and cultural values of the sandy grasslands.

The Biosphere Office has been working consistently to increase knowledge for the last ten years. Inventories of the special flora and fauna of the sandy grasslands have been executed in a number of locations. An overall landscape analysis of the sandy areas near Åhus has also provided a valuable basis for the conservation work. The biosphere work has also focused on providing broad information concerning the high natural value of the sandy agricultural land, and on highlighting problems relating to areas gradually becoming overgrown and also exploited by the expansion of agriculture, living areas and infrastructure. This has resulted in a number of areas being given permanent protection. Another example is inventories under the direction of the Biosphere Office for the military Åsum field training area, which has highlighted the area as a national hotspot for red-listed insects and fungi. Proposals and plans have been prepared on the basis of this as regards how the high natural value of the Åsum Field can be safeguarded and reinforced simultaneously with the use of the area by both the armed forces and for recreational purposes (see 4.3).

Other examples of projects that have been implemented or are ongoing:

1. ***Project Sand Pink*** (2011-2013): A project to disseminate interest and awareness of the rare flower sand pink specifically and the natural vegetation on sandy grasslands in Åhus in general. This included garden tours and information evenings and the planting of sand pink grown from collected seeds. The management of green areas where sand pink grows was adapted so that the plant can flower undisturbed during the summer.
2. ***Multifunctional golf course*** (2008-2011): A cooperation was initiated between the Biosphere Office and Kristianstad Golf Club in connection with the extension of the golf course in Åhus in order to create an environmentally certified golf course that is accessible to many people and that is managed in adjustment to the area's high natural, cultural and recreation values (see 4.3 for details).
3. ***Actions in the sandy grasslands of Vattenrike*** (2011-2015): The project has been 50% government-financed and covers the restoration of valuable sandy grasslands, inventories to increase knowledge, monitoring of measures and various types of information initiatives. The project has inspired to actions on a broader scale in sandy grasslands outside of the project.

Lakes and watercourses

Biosphere activities have markedly increased in the biosphere reserve's lakes and watercourses since a limnologist was employed at the Biosphere Office in 2010. Key aspects of the work have been to reduce brownification and eutrophication in aquatic environments, to counter fragmentation and to restore watercourses that have been affected/drained. The Biosphere Office has worked with watercourses with elevated levels of brown water both inside and outside the biosphere reserve to learn more about the causes of brownification and the effects that it has on the ecosystem. The work is based on a landscape perspective, where various management measures are tested to investigate the measures that are most appropriate to remedy the problem. The work also aims to make landowners aware of the problem and to raise awareness regarding the possible link between forestry and brownification.

The work of the Biosphere Office to reduce eutrophication has focussed on the River Vinne å, which is one of the most polluted rivers in the municipality. This work has been carried out through the project *The River Vinne å – for good ecological status* (2011-2014). This local water conservation project (LOVA project) was a collaboration between Kristianstads Vattenrike Biosphere Reserve, the municipal authorities of Kristianstad and the neighbouring municipality of Hässleholm. More than 80 hectares of wetlands have been created in the River Vinne å catchment area, this has reduced the transport of nutrients into the Baltic Sea. The work has largely consisted of outreach activities and a strong emphasis has been placed on the dissemination of information to landowners regarding the potential to create wetlands and protection zones. Actions to reduce eutrophication will be expanded to other agriculture-related watercourses in the biosphere reserve through the project entitled *A better balance in the River Helge å and the Hanöbukten bay area* (see above). An area of around 70 hectares of wetlands has so far been created, in addition to the areas created under the River Vinne å project.

The Biosphere Office has restored a previously drained part of the River Vinne å in partnership with a landowner. By restoring the river bed, the water can once again flood the surrounding land. Through the reintroduction of large stones and gravel on the restored river bed, valuable environments have been created both for species that live in areas where there is a current and for species that require slower water flows.

Survey fishing has been performed in the lakes and watercourses of the biosphere reserve to monitor fish populations, and inventories have been prepared for threatened species, such as large freshwater mussels (e.g. Thick shelled river mussel - *Unio crassus*) and River water crowfoot (*Ranunculus fluitans*). Since 2011, survey fishing has been conducted for European catfish (*Silurus glanis*), among other species, in the River Helge å. The European catfish has been included as a selected species in the national work to conserve threatened species. Data from the samples will be included in the basis for an action programme for European catfish, which will be prepared by the Swedish Agency for Marine and Water Management. The work in connection with monitoring and survey fishing for the European catfish is carried out under the direction of the Biosphere Office and in consultation with the County Administrative Board of Skåne, which has also financed aspects of the project.



Photo: Patrik Olofsson/N

Urban countryside - important for man and wildlife

The city of Kristianstad is located in the middle of the Vattenrike Biosphere Reserve. Here, along the River Helge å, lie beautiful and important wetland areas. Otters (*Lutra lutra*), kingfishers (*Alcedo atthis*) and people are frequent visitors. The urban wetlands around Naturum Vattenriket visitor centre were turned into Årummet nature reserve in 2012 on the initiative of the Biosphere Office. These valuable wetlands are now protected. At the same time, the nature and leisure

assets may be developed for the residents of the future urban district of Vilans Strandäng. Other environments with an urban connection are the sandy grasslands around the urban area of Åhus. The rare sand pink (*Dianthus arenarius*) thrives in this area. The Bio-sphere Office has held garden tours and information evenings in order to disseminate knowledge. New plants have been planted and green areas featuring the sand pink are only cut when the plant has finished flowering.

4.3 In what ways are conservation activities linked to, or integrated with, sustainable development issues (e.g. stewardship for conservation on private lands used for other purposes)?

The working method to be used in the biosphere reserve has a general biospheric focus. This means that the three functions of conservation, development and logistic support will form an integral part of all the work that is performed in the biosphere reserve. Therefore, conservation measures will be combined with management measures and approaches in connection with all management that promotes the sustainable utilisation of nature. Dialogue, cooperation and commitment from local stakeholders are also central aspects of the biosphere activities. Some examples are given below to illustrate this:

Protection and restoration of sandy grasslands: There has been a significant increase in the level of knowledge concerning the biological value of sandy grasslands in the biosphere reserve during the past ten years. A major factor behind this has been several biological inventories under the direction of the Biosphere Office which have highlighted that sandy grasslands in the biosphere reserve are amongst the most species-rich natural environments in the country. Sandy grasslands with a very high natural value have on this basis been protected as nature reserves in cooperation with the County Administrative Board and the Swedish

Environmental Protection Agency. Restoration and management methods in species-rich sandy grasslands have been developed and monitored in various projects. The management methods are now applied not only in the protected areas, but also in the management of valuable sandy areas in military exercise areas, public parkland and road verges. Knowledge regarding the value of sandy grasslands has been disseminated to the public through the visitor centre, media, guides and the production of various information systems. Another example of the application of biospheric methods for development and support with regard to the value of sandy grassland is the cooperation with the golf club in Åhus.

A multifunctional golf course in Åhus: In this project, the Biosphere Office collaborated with Kristianstad Golf Club to establish an environmentally certified and multifunctional golf course to promote the high natural value of the area. The club and the Biosphere Office have worked together in connection with cultural and nature conservation measures, information and public access. An environmental committee meets regularly with the participation of the Biosphere Office. This includes planning measures for the cultural and natural values in accordance with the management plan for the gold course. A footpath has been created through the golf course to encourage outdoor recreation for the public. Illustrated information signs on the golf course and along the footpath provide information on the natural value of the area. The cooperation to create a multifunctional golf course has resulted in the club being approved in accordance with the international certification Golf Environment Organisation (GEO) as the third club in Sweden and the 30th in the world (2011).



Photo: Patrik Olofsson/N

The multifunctional golf course in Åhus combines golf, nature conservation and outdoor activities

The Biosphere Office is working with Kristianstad Golf Club to establish an environmentally certified and multifunctional golf course. The project promotes and makes accessible the high natural value of the area. The club and the Biosphere Office are working together in connection with cultural and nature conservation measures, information and public access. An environmental committee with representatives from the club, a botanist and an ecologist from the Biosphere

Office plan measures in accordance with a management plan for the golf course's cultural and natural values. A trail has been created to encourage active outdoor recreation. Information signs around the golf course and along the trail provide information on the natural and cultural values in the area. The cooperation has resulted in the club being approved in accordance with the international environmental certification of the Golf Environment Organisation (GEO) in 2011.

Årummet nature reserve and wetland area in Kristianstad: Plans for parts of this wetland area located close to the city initially included the exploitation for development purposes. However, it was subsequently decided to create a nature reserve through an initiative by the Biosphere Office in collaboration with civil servants and political decision-makers. This was based on the important ecosystem services that the area brings to the city in the form of flood protection and as a nature area close to an urban area with considerable recreation potential. The high natural values of the area have been conserved and developed. Together with its high natural value, the area is of great importance for recreation due to the location on walking distance to the city of Kristianstad and with the biosphere reserve visitor centre in the middle of the reserve. This enhances the biospheric identity 'for the benefit of man and nature' and also further enhances the attractiveness of the visitor centre. People are able to experience the rich bird life and the value of water practically in the city. The location of Årummet and the visitor centre in an urban area and the proximity of schools and public transport is also of great importance for educational nature activities.

River Vinne å – for good ecological status: The project has led to a total of 70 hectares of wetlands being created in cooperation with private landowners. The project has a number of biospheric aspects, in addition to its main aim of reducing eutrophication of the water system. Knowledge of wetlands and environmental aspects have increased, as has the level of interest and engagement amongst landowners. The wetlands provide valuable new bird habitats in the cultivated landscape, which also benefits nature tourism and outdoor recreation. Many of the wetlands created as part of the project can also be used as irrigation reserves. During the winter, water can be stored for use during summer droughts, which means reduced irrigation loads on nearby watercourses and groundwater reserves.

Cooperation with C4-Teknik: The Biosphere Office has developed new working methods together with the technical administration of Kristianstad Municipality (C4-Teknik) to promote biodiversity on land owned by the municipality. Amongst other things, the vegetation in natural grasslands and green areas is cut and collected only once a year in order to encourage flowering and wild bees. In connection with the laying of cables, trench lines are not refilled with topsoil and sowed as was the case previously, instead the natural pure sand on sight is left on the surface in order to promote the natural succession of the diversity of sandy ground.

Other examples of conservation work with a focus on sustainable development:

1. The work in connection with the restoration and management of wet grassland along the Lower River Helge å.
2. Cooperation with the armed forces regarding measures for the Åsum and Rinkaby military exercise fields.

Crane- and goose-related activities in collaboration with stakeholders, non-profit organisations and local authorities.

4.4 How do you assess the effectiveness of actions or strategies applied?

(Describe the methods, indicators used).

There are no specific methods or indicators to determine the effectiveness of the measures implemented on a large scale. However, there are many good examples to suggest that the adaptive working method used in the biosphere reserve leads to good and noticeable effects. The level of success from different aspects of conservation work has been discussed in connection with the production of this review, and according to this some examples of significance are given below:

1. In general, the level of knowledge regarding the biosphere reserve and trust in the Biosphere Office's conservation work has increased among decision-makers, landowners, local stakeholders and the general public.
2. Greater attention and consideration has been shown to nature conservation and valuable natural environments in the municipality's planning processes.
3. The visitor centre is an informative and educational hub for the biospheric activities. In 2014, Naturum Vattenriket visitor centre was the most frequently visited out of a total of 33 Naturum visitor centres located at important nature reserves and national parks of Sweden.
4. Kristianstads Vattenrike Biosphere Reserve has attracted attention at local, regional, national and international levels for its successful work. Representatives from municipal authorities in other areas of the country and national authorities regularly visit the biosphere reserve in order to learn more and to be inspired by the activities being carried out. Similarly, the work has been highlighted as a successful example of adaptive co-management by national and international researchers.
5. Large areas of wetlands along the River Helge å have been turned into a nature reserve thanks to a good dialogue and cooperation with farmers.
6. Awareness of the unique biological and cultural values of sandy grasslands has increased, the protection of valuable areas has been secured and management methods have been developed.
7. A positive dialogue and the development of knowledge and methods has led to increased interest and engagement among landowners in the new establishment of wetlands and the restoration of watercourses.
8. The cooperation relating to crane and goose management has resulted in more farmers being satisfied with the measures implemented to reduce the damage caused by the birds.
9. The Swedish Environmental Protection Agency, together with the Stockholm Resilience Centre, has decided to conduct a pilot study on ecosystem service analysis in the biosphere reserve. Kristianstads Vattenrike Biosphere Reserve has also been mentioned in a government study regarding the way in which the profile of ecosystem services can be raised.

4.5 What are the main factors that influenced (positively or negatively) the successes of conservation efforts in the entire biosphere reserve? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be most effective for conservation for sustainable development?

In summary, the Biosphere Office's strategy for conservation work is based on a sensitive and creative dialogue with stakeholders in the biosphere reserve, the continual collection and evaluation of new knowledge on natural values and the state of the environment, the development of new and better restoration and management methods and the cooperation with research. The results of this adaptive co-management approach can be demonstrated through a number of specific examples of the work's success.

Change in attitudes: An important lesson from the previous ten years is that changes in attitudes across a very broad spectrum promote successful conservation work. Valuable trust in biosphere activities generally has been developed through good cooperation with landowners and local stakeholders. This has contributed towards a change in attitudes and, for example, an increase in the number of stakeholders applying new and more sustainable methods in the everyday landscape.

Broadly anchored conservation work: The Biosphere Office's dialogue and cooperation with various stakeholders has helped to create trust and a more positive attitude to the conservation work. An example of this is the fact that grazing and mowing wet grasslands along the River Helge å is being successfully managed in cooperation with livestock farmers. Other changes are that more landowners are now seeking advice and assistance in conserving and developing valuable sandy grasslands in the rural landscape and an increase in interest in creating wetlands and implementing biotope conservation measures in watercourses. The establishment of new nature reserves in sandy grasslands in cooperation with government agencies is another example of specific conservation work.

Increased ecology skills: The conservation work being carried out at the biosphere reserve has been developed in various ways by the biosphere reserve's ecologists. This work has gathered speed with regard to marine areas and freshwater environments following the appointment of a limnologist at the Biosphere Office. Ecological skills have also been enhanced with regard to knowledge relating to unique natural values and management methods linked to sandy grasslands. More recently, there has also been an increase in the level of knowledge with regard to investigations and trials involving measures to reverse the generally negative trends associated with breeding wading birds in wet grasslands, which also affects the biosphere reserve.

Successful project activities: The Biosphere Office is continually applying for and carrying out conservation-related projects with the aid of external financing. These usually cover knowledge-enhancing activities, the protection of areas, specific restoration and management measures and information dissemination and communication. Kristianstads Vattenrike Biosphere Reserve's experience and good reputation in all likelihood contributes to the fact that we are entrusted to carry out the projects for which applications are submitted, which in itself reinforces the continued conservation work.

4.6 Other comments/observations from a biosphere reserve perspective.

The fact that the biosphere work is carried out in a professional manner with knowledge at the forefront and method development as a basis is fundamental for the strategic conservation work. It is also necessary to build and maintain trust with various stakeholders in order to ensure success. Dialogue and sensitivity are the building blocks in such a process of creating trust. Preparedness regarding changing external factors and trends is also an integral aspect of the conservation work. Over the past ten years, Kristianstads Vattenrike Biosphere Reserve has prioritised and developed the conservation work relating to the wetland areas along the River Helge å, valuable watercourses, sandy grasslands and nature close to urban areas, all of which contain a concentration of species-rich environments and are vulnerable to various types of negative environmental change. In summary, the experience gained to date will be applied and developed further in the ongoing conservation work being carried out in Kristianstads Vattenrike Biosphere Reserve.

5. THE DEVELOPMENT FUNCTION

[This refers to programmes that address sustainability issues at the individual livelihood and community levels, including economic trends in different sectors that drive the need to innovate and/or adapt, the main adaptive strategies being implemented within the biosphere reserve, and initiatives to develop certain sectors such as tourism to complement and/or compensate for losses in other markets, employment, and community well-being over the past ten years]

5.1 Briefly describe the prevailing trends over the past decade in each main sector of the economic base of the biosphere reserve (e.g. agriculture and forest activities, renewable resources, non-renewable resources, manufacturing and construction, tourism and other service industries).

Agriculture and manufacturing

Around 5.5 percent of the municipality's workforce is employed in the farming and agriculture sector, which supplies its products to the food industry.

The manufacturing industry is the largest industrial sector and employs almost one third of the working population. The food industry dominates manufacturing, which is firmly rooted in the municipality with a number of the country's leading food companies and brands at the forefront.

Agriculture in Kristianstad Municipality has expanded and intensified since the Vattenrike area became a Biosphere Reserve in 2005.

Organic agriculture has become increasingly popular, and use of the KRAV-approved mark has almost doubled in Kristianstad Municipality during the past ten years.

A distinct trend over the past ten years has been an increase in small-scale food production involving the production of high-quality food on a small scale. This often involves some form of raw materials processing.

Fishing

Commercial fishing in the biosphere reserve has virtually disappeared.

Forestry

Forests are a significant part of the Swedish landscape and many people use such areas for recreation and natural experiences. The biosphere reserve contains forest environments in the bedrock areas of Linderödsåsen, Nävlingeåsen and Balsberget, in addition to areas scattered across the plain and along the wetland area and coast.

The Swedish Forest Agency has been commissioned by the government to produce an inventory of key biotopes on private land. Around 650 ha of forest land were classified as key biotopes in 2005. This figure rose had risen to 827 ha by 2012. The identification of more key biotopes has in turn resulted in a larger area of protected land through the establishment of more Natura 2000 sites and sites with habitat protection areas.

Tourism

There has been a general increase in interest in and demand for sustainable tourist products.

Active holidays involving an element of learning are becoming increasingly sought-after. The Municipal Executive Office of Kristianstad Municipality has worked to stimulate the development of these types of product since 2008. The tourism industry has generally increased in Kristianstad Municipality since 2005, with the Vattenrike being an important reason behind this. According to the most recent calculations from 2013, turnover exceeded SEK 860 million, which represents an increase of almost 30 percent since 2005, when the turnover was just over SEK 600 million.

The Biosphere Office has been working actively since 2005 to improve and develop the infrastructure and information at visitor sites with accessibility adaptations, new exhibitions and signs. Naturum Vattenriket visitor centre was opened in November 2010 and has had over 500,000 visitors since then.

Commerce

Kristianstad has a long tradition as a commercial centre and the importance of retail tourism is increasing.

Internet commerce is growing rapidly and companies vary in their approach to this. Many are supplementing their stores by providing customers with an opportunity to purchase goods via a website, and others are using the internet as a communication channel. In the long term, shops and town centres could become a place for face-to-face meetings.

Kristianstad is the commercial centre for north eastern Skåne, and is the main town for 275,000 consumers in 11 surrounding municipalities. The growing commercial centre means that each year more people find work here, and more than half of all residents in the municipality currently work in the service sector.

5.2 Describe the tourism industry in the biosphere reserve. Has tourism increased or decreased since nomination or the last periodic review? What new projects or initiatives have been undertaken? What types of tourism activities? What effect have these activities had on the economy, ecology and society of the biosphere reserve? Are there any studies that examine whether designation of the area as a biosphere reserve has influenced the number of tourists? Please provide the bibliographic information of any studies and/or a paper copy in an annex.

Kristianstads Vattenrike Biosphere Reserve and its 21 visitor sites attract around 150,000 visitors per year. Since the biosphere reserve's visitor centre (Naturum Vattenrike) was opened in November 2010, it has become one of Kristianstad's biggest tourist destinations, with more than 100,000 visitors every year. The visitor centre welcomed its 500,000th visitor in October 2014. Vattenrike Biosphere Reserve and visitor centre offers exhibitions, guides and activities attracting both young and old visitors alike. Naturum Vattenrike visitor centre serves as a gateway to Vattenrike Biosphere Reserve and contributes towards more people visiting other sites in the biosphere reserve.

Kristianstads Vattenrike Biosphere Reserve's tourism and recreation infrastructure is comprehensive and makes it easier for visitors to experience the varied nature of the biosphere reserve. There are 21 visitor sites, several hiking trails, a 65-km long cycling trail and good opportunities for fishing and birdwatching from birdwatching towers, bridges and duckboards.

The Biosphere Office has been working actively since 2005 to improve and develop the infrastructure and information at visitor sites with accessibility adaptations, new exhibitions and signs. This is a great benefit to visitors, ecotourism entrepreneurs and associations.



Photo: Marie Grönvold

Broad trails and boardwalks make Biosphere Reserve visitor sites accessible for all

Few areas in Sweden have as rich and varied nature as Kristianstads Vattenrike Biosphere Reserve. There are 21 visitor sites to enjoy in this area. The Biosphere Office has been actively working since 2005 to improve and develop the infrastructure and information at visitor sites with accessibility adaptations, new exhibitions and signs.

The Tivolibryggan and Lillöbryggan jetties make it easier for wheelchair users to travel by boat on the River Helge å. The new Canal House boardwalk is part of the work to make the Linnérundan trail accessible for wheelchair users and pushchairs.

Five visitor sites have been adapted for people with disabilities through the project 'Improved accessibility for everyone in Vattenriket'. Ekenabben has been equipped with oak board walks, disabled toilets and an accessible fishing jetty.

There has been general growth in the tourism industry in Kristianstad Municipality since 2005. Many visitors come to Kristianstad Municipality for natural experiences in the Vattenrike Biosphere Reserve and for sunshine and bathing on the long sandy beaches along the coast. Kristianstad Municipality has commissioned studies of the tourist economy in order to evaluate and analyse the development of the tourism industry. Similarly, the financial impact of tourism in the biosphere reserve has been studied on two occasions in 2011 and 2013 (see question 5.4). Turnover of the tourism industry in Kristianstad Municipality in 2013 exceeded SEK 860 million, representing an increase of almost 30 percent since 2005, when the turnover was just over SEK 600 million. This has resulted in new employment opportunities. Between 2005 and 2013, the number of full-time employees rose from around 600 to 750 people, resulting in higher tax revenues for the municipal authority (RESURS 2011, 2014). In addition, local farmers were supported by the increase in tourism, as many farmers supply restaurants and businesses with locally produced food products. Visiting farm shops and buying local produce are also popular among tourists, resulting in an increase in sales of these products.

A similar study of the tourism economy has been performed using Naturum Vattenrike visitor centre as a starting point. This is described under article 5.4.

5.3 When applicable, describe other key sectors and uses such as agriculture, fishing, forestry. Have they increased or decreased since the nomination or the last periodic review? What kind of new projects or initiatives have been undertaken? What effect have they had on the economy and ecology of the biosphere reserve, and on its biodiversity? Are there any studies that examine whether designation as a biosphere reserve has influenced the frequency of its activities? If so, provide the bibliographic information of these studies and/or a paper copy in an annex.

Agriculture

Agriculture in Kristianstad Municipality has expanded and intensified since the Vattenrike area became a Biosphere Reserve. The light, sandy soils have become increasingly attractive for vegetable cultivation (lettuce, onions, cabbage and carrots, etc.). The number of protected areas has increased during the same time period, largely thanks to the biosphere activities in order to conserve the unique nature of the area and to compensate for the expansion in agriculture. The work of the Biosphere Office to promote the traditional management of the wet grasslands and sandy grasslands, along with increased demand for natural grazing land, has meant that the amount of grazing land and wet grassland with environmental support has also increased during the same period.

Organic agriculture has become increasingly popular, and use of the organic standards KRAV-approved land has almost doubled in Kristianstad Municipality during the past ten years. More farmers have joined the national project entitled 'Focus on nutrients', which is a knowledge and advisory project aiming to provide farmers with a better understanding of nutrient leaching within agriculture and to reduce greenhouse gas emissions, reduce eutrophication and promote the safe use of plant protection products. The project is a cooperation between the Swedish Board of Agriculture, the Federation of Swedish Farmers (LRF), County Administrative Boards and other advisory organisations.

The Biosphere Office has been very active in recent years in encouraging and supporting farmers to create wetlands to reduce nutrient leaching. This has partly taken place within the framework of the Biosphere Office and Kristianstad Municipality project 'Reduced eutrophication in the River Vinne å' (*Minskad övergödning i Vinneå*). The aim of this was to create 50 ha of wetlands in the agricultural landscape, which was achieved by a good margin and resulted in the creation of 80 ha of new wetlands. Besides a reduction in nutritive salts, the wetlands have resulted in greater biodiversity and also act as irrigation reservoirs, supporting the economy of agricultural enterprises.

Fishing

Commercial fishing in the biosphere reserve has largely disappeared. Eel fishing continues to take place along the Åhus coast. Fishing is tightly regulated, and since 2007 only fishermen with previously issued permits have been allowed to fish for eel.

Forestry

Forests are a significant part of the Swedish landscape and many people use such areas for recreation and natural experiences. Many people consider it to be invaluable to be out in the forest and to enjoy the beautiful nature, hunting, fishing, exercising and picking berries and mushrooms or simply enjoying the silence of the forest. In general, forests close to urban areas have the highest social values. This is simply because the majority of the Swedish population lives either in or close to urban areas.

It is becoming increasingly common for forest owners to live in a different location from the farm where their forest is located. Remote ownership means that owners largely manage the forest with the aid of other people and companies. This in turn provides an opportunity to establish new companies.

At the request of the government, the Swedish Forest Agency has been working to prepare an inventory of key biotopes on private land since 1990. Key biotopes are discovered every year because many biotopes are still unknown. Around 650 ha of forest land were classified as key biotopes in 2005. The figure had risen to 827 ha by 2012. The identification of more key biotopes has resulted in a larger area of protected land through the establishment of more Natura 2000 sites and habitat protection areas.

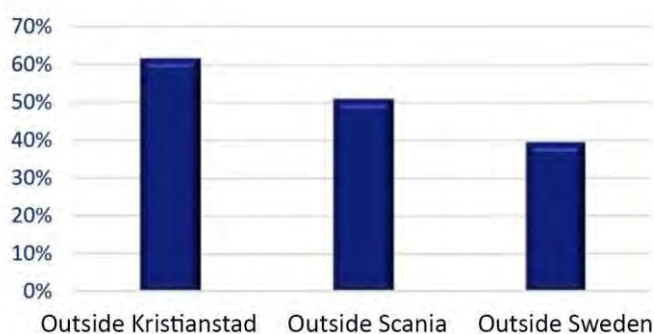
5.4 How do economic activities in the biosphere benefit local communities?

Several hundred thousand people visit Kristianstads Vattenrike Biosphere Reserve and its visitor centre annually. The Biosphere Office has collected a large amount of interview material in two studies from visitors to the Naturum Vattenriket visitor centre in order to understand the financial effects that visits to the centre have on employment and the local economy. These interviews have subsequently been analysed by a company with experience of financial tourism calculations.

Visitors to the biosphere reserve support the surrounding industry through their use of transport, accommodation, shops and eating establishments. As might be expected, this has a positive effect on Kristianstad.

The financial effect of tourism brought about by visitors with the main objective of visiting the Vattenrike Biosphere Reserve amounted to SEK 25 million in 2011 and SEK 28 million in 2013. This creates jobs and tax revenue that would not have been generated without the Vattenrike Biosphere Reserve and visitor centre (RESURS 2012 and 2014).

| | |
|------------------------|--------|
| ▲ Outside Kristianstad | 61,8 % |
| ▲ Outside Scania | 50,9 % |
| ▲ Outside Sweden | 39,5 % |



5.5 How do you assess the effectiveness of actions or strategies applied?

(Describe the methods, indicators).

Naturum Vattenriket visitor centre keeps detailed statistics of the number of visits, participants in programme activities, guided groups and other groups that have made bookings. These statistics are supplied to the Swedish Environmental Protection Agency every month. Qualitative data is collected in addition to this, e.g. through online surveys to assess visitor satisfaction. The visitor centre also has guest books, which are used extensively for visitors to provide their views and comments.

The adaptive co-management, which is the working method adopted by the Biosphere Office, means that continuous evaluation forms part of the process (see chapter 2).

Kristianstads Vattenrike Biosphere Reserve has attracted the attention of many international researchers because of its way of working towards sustainable development and has been highlighted as a successful example. For example, the Stockholm Resilience Centre, a leading research institute in sustainable development, has decided to focus three doctoral theses on the Biosphere Office's way of working. These may be considered as good evidence and indicators that the working method is successful and that the biosphere reserve is fulfilling its role as a model area for sustainable development.

5.6 Community economic development initiatives. What programmes exist to promote comprehensive strategies for economic innovation, change, and adaptation within the biosphere reserve, and to what extent are they implemented?

Rural Development Programme

The 50%-financed Rural Development Programme (EU) plays a major economic role in the development of rural areas. This is a comprehensive programme, which ranges from direct environmental support in connection with the maintenance of grazing land and wet grasslands to the potential to create new wetlands and skills development. The restoration work being carried out in the biosphere reserve has included wet grassland, which has led to greater profitability for agricultural businesses.

The Rural Development Programme in Skåne

As part of the Rural Development Programme, the County Administrative Board of Skåne has produced regional guidelines in accordance with the guidelines of the Swedish rural development policy. On the basis of the conditions in Skåne, the programme aims to promote higher employment and sustainable growth in rural areas whilst at the same time minimising negative environmental effects and safeguarding the cultural and natural values of the landscape. An important aspect of the Rural Development Programme is the EU Leader method, which enables cross border cooperation concerning local rural development between individuals and enterprises in rural areas and the public sector. Kristianstad belongs to the Skåne ESS Leader Office, together with the municipalities of Bromölla, Osby and Östra Göinge. During the period 2007-2013, SEK 48.9 million has been invested in various types of development project with the vision of attracting residents, businesses and visitors to rural areas. The Biosphere Office has participated in a number of Leader supported projects.

The Biosphere Office's various economic development initiatives

The development work forming part of the biosphere activities is primarily aimed at developing and utilising the value of ecosystems in a sustainable way. The work under various projects forming part of the landscape theme blends conservation measures with development work, which means that there is no single programme aiming solely to develop a strategy for economically sustainable development (see 4.2).

The management of wet grasslands is a good example of the Biosphere Office's coordinated function in which conservation and development are combined. Large areas of wet grassland were flooded in the summer of 2007, with the result that livestock farmers could not keep their cattle on the grasslands. Many farmers risked losing their support from the EU because they were forced to remove the cattle and discontinue grazing in the worst affected areas. The Biosphere Office worked very actively to acquire knowledge and inform the authorities that

the farmers were unable to manage the areas in accordance with the regulations, which resulted in the livestock farmers not being affected financially.

5.7 Local business or other economic development initiatives. Are there specific “green” alternatives being undertaken to address sustainability issues? What relationships (if any) are there among these different activities?

At a general level, green initiatives and sustainability work have become increasingly common during the past ten years in Sweden. Sustainability strategies are now something that can be found in both the private and public sectors.

In Kristianstad, there are a number of examples of local companies and economic development initiatives that address environmental and sustainability issues. Kristianstad Municipality performs both active and ambitious environmental work with the target of creating a good living environment for everyone. For example, the municipality's climate-related work aims to make Kristianstad a fossil fuel-free municipality. Food waste from households and restaurants is digested to produce biogas. Biogas is used in the district heating system and as a transport fuel. All city buses in Kristianstad and the municipal car pool are powered using biogas.

So-called Technical visits/Green Tech visits have been provided in order to meet demand from international and national visitors interested in Kristianstad's successful sustainability work. Many of the groups that visit are interested in both the working model for the biosphere reserve, including the visitor centre and the municipality's work with biogas.

Some examples of local economic development initiatives that are rooted in the work of the Biosphere Office include the multifunctional golf course in Åhus and meat products from wet grasslands and smoked goose breast.

The multifunctional golf course in Åhus is a good example of a local company with a genuine interest in environmental and sustainability work. Kristianstad Golf Club and the Biosphere Office are working together to maintain a multifunctional golf course. The playing surfaces coexist with areas that are managed to conserve the area's cultural and natural values at the golf course. Paths have been created, signs relating to the natural values have been erected and schoolchildren can learn about the multifunctional golf course in an outdoor classroom. (see question 4.3 for details).

An increasing number of farmers in the biosphere reserve have decided to switch to more environmentally friendly cultivation as described under question 5.3. The number of organic agricultural enterprises has increased, as has the demand for natural grazing land. The '*Beef from Wet Grasslands*' (*Strandängskött*) brand was also introduced in connection with the establishment of Vattenrike Biosphere Reserve on the initiative of four wet grassland farmers. The meat is marketed as being from animals that generate nature conservation benefits for the wet grasslands, and is sold as a delicatessen meat at a local supermarket in Kristianstad. '*Smoked wild goose breast from the Vattenrike*' (*Rökt vildgåsbröst från Vattenriket*) is another example of a food product from Vattenrike Biosphere Reserve with a conservation benefit. The major problem of damage caused by grazing geese has been turned into a positive development through smoking the goose breast meat obtained through hunting and then selling it as a delicatessen product.

5.8 Describe the main changes (if there are any) in terms of cultural values (religious, historical, political, social, ethnological) and others, if possible with distinction between material and intangible heritage.

The Biosphere Office is working to preserve the traditional management of wet grasslands. These land areas have been used for generations for mowing and grazing. There was a decline in interest in using these land areas during the 1970s and 1980s, and consequently the land began to become overgrown. The Biosphere Office and the County Administrative Board have successfully worked with landowners to resume the management of the wet grasslands. The biosphere reserve is now the largest area of wet grassland in Sweden that is used for grazing and haymaking.

In the same way, there is considerable local knowledge regarding the rotation system of cultivation and fallow used in the dry sandy land areas in the biosphere reserve. Local knowledge has been utilised and implemented using modern technology with a sharp increase in biodiversity as a result.

5.9 Community support facilities and services. What programmes in/for the biosphere reserve address issues such as job preparation and skills training, health and social services, and social justice questions. What are the relationships among them and with community economic development?

Kristianstad Municipality has a department responsible for helping the unemployed and people on long term sick leave to find work. This includes the provision of traineeships and job training in places such as the Biosphere Office. The Biosphere Office and visitor centre also offers students from secondary schools and universities the possibility of placements and assistance with examination work (see 6.4).

The Biosphere Office and visitor centre also plays an important role in the well-being of residents. The activities promote good mental and physical health by providing natural experiences close to urban areas. Guides and coach trips to Pulken during times when cranes are present, guided cycle tours to visitor sites and walks to the Lillö medieval castle ruin are some examples of this.

Additionally, many of the biosphere reserve's visitor sites and hiking trails have been adapted for wheelchairs and pushchairs in order to improve accessibility for these groups (see 6.7). Some of the visitor centre's activities/programmes also focus on 'the tranquillity of nature', which includes sensory walks and experiences.

5.10 What indicators are in place to assess the effectiveness of activities aiming to foster sustainable development? What have these indicators shown?

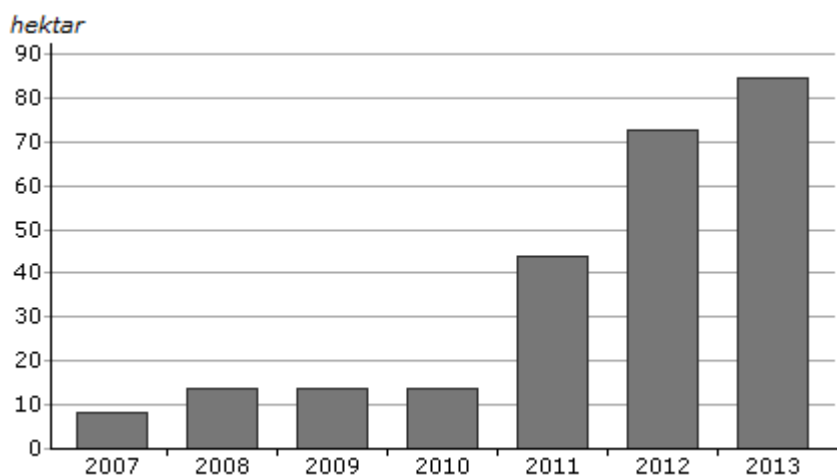
The Biosphere Offices does not have individual indicators to measure the effectiveness of activities promoting sustainable development. However, comprehensive follow-up takes place through the environmental objective work in Kristianstad Municipality.

Sweden is working on 16 national environmental objectives in various areas to reduce negative impacts on the environment and promote sustainable development. Regional and local objectives are then produced based on the national objectives. The environmental objectives are followed up annually in order to evaluate the work and report developments to the government. The forecasts regarding the extent to which the goals will be achieved within

the appointed time may be considered as indicators of the effectiveness of the environmental work at national, regional and local levels.

Kristianstad Municipality is actively working to achieve 15 locally developed environmental objectives. The development and success of the work is reported annually in the municipality's annual report and in the Environmental and Health Board's more detailed environmental report. According to the most recent forecast, Kristianstad Municipality is well on the way to achieving the objectives: *Limited climatic impact, No eutrophication, Natural acidification only and A good built environment.*

Kristianstad Vattenrike Biosphere Reserve has been included in the forecasts for Kristianstad Municipality's environmental objectives. The areas of newly created wetland in the cultivated landscape provide an example of environmental objective follow-up indicating sustainable development in the biosphere reserve.



These are the areas of newly created wetlands in the agricultural landscape that received grants via the Rural Development Programme. The Biosphere Office and the Environmental and Health Protection Office for Kristianstad Municipality have worked successfully to create new wetlands in order to reduce nutritive salt loads in the River Helge å and Hanöbukten bay. There has been a tenfold increase in the area of newly created wetlands during the period from 8.15 ha to 84.6 ha.

5.11 What are the main factors that influenced (positively or negatively) the success of development efforts in the entire biosphere reserve? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be most effective?

Several factors have been of particular importance in the development work in the biosphere reserve and have had a positive effect on this work:

1) Trust

The basis behind the success is the long-term work to create trust, which has been taking place for a considerable period of time. Dialogue and cooperation in connection with small projects forms the basis for larger projects. Commitment and trust has been created through the participation of stakeholders and interested parties. Ongoing dialogue and knowledge exchange also promote learning with regard to sustainable development.

2) Municipal commitment

Kristianstad Municipality and the Municipal Executive Office are the responsible authorities for Kristianstads Vattenrike Biosphere Reserve. As the authority responsible for the activities,

the municipal authority is committed and interested and can see the considerable benefit of the biosphere work to the municipality. The municipal authority has also supported the work being carried out in the biosphere reserve in various ways, and has also reaped the benefits of this work, e.g. in the form of revenue from tourism.

Being part of the municipality means many benefits for the development work. Here at the Biosphere Office, we are able to contribute with our knowledge, together with other municipal administrations and their networks.

Kristianstad Municipality has had a strong focus on the construction of Naturum Vattenriket visitor centre during the period. This is perhaps the largest single piece of evidence of the considerable commitment of the municipal authority. The visitor centre, which during the period has attracted more than 500,000 visits, has in turn contributed to the attractiveness of the municipality and the local tourist economy.

6. THE LOGISTIC FUNCTION

[This refers to programs that enhance the capacity of people and organizations in the biosphere reserve to address both conservation and development issues for sustainable development as well as research, monitoring, demonstration projects and education needed to deal with the specific context and conditions of the biosphere reserve.]

6.1 Describe the main institutions conducting research or monitoring in the biosphere reserve, and their programmes. Comment on organizational changes (if any) in these institutions over the past ten years as they relate to their work in the biosphere reserve.

Research is being conducted at Kristianstads Vattenrike Biosphere Reserve within various fields by universities and government institutions. The biosphere reserve also attracts researchers from other parts of the world and the reserve has been cited in a number of international scientific periodicals.

The monitoring carried out at the biosphere reserve follows the Swedish model of long-term and regular environmental monitoring and has generated long series of measurements without equal anywhere else in the world. The national environmental monitoring is coordinated by the Swedish Environmental Protection Agency and is carried out under ten different programme areas. The County Administrative Boards are responsible for and coordinate the monitoring at regional level, while municipalities are responsible for local monitoring. Environmental monitoring is also performed by non-profit organisations and universities.

Question 2.4.6 contains a list of the main institutions and their associated specialisations with research or monitoring.

6.2 Summarize the main themes of research and monitoring undertaken over the past ten years and the area(s) in which they were undertaken in order to address specific questions related to biosphere reserve management and for the implementation of the management plan (please refer to variables in Annex I).

Many research and monitoring programmes have been conducted over the past ten years that have assisted the biosphere activities and guided the biosphere reserve in our action programme. The Biosphere Office has led these activities within the thematic landscapes either under the direction of or in cooperation with other bodies. These are described in Chapter 4. 'Adaptive co-management' has been applied at the biosphere reserve. This is an approach which focuses on cooperation and learning the lessons of how different measures impact on nature and society. This approach is characterised by gathering knowledge relating to a potential project area through the preparation of inventories of the flora and fauna and through dialogue with local stakeholders. The project is then developed, and appropriate measures are applied as required. This may involve the establishment of a nature reserve, or conservation measures for specific species. This is regularly followed up to evaluate the effects of the initiatives and allow measures to be corrected as and when necessary. Some of the activities under the project therefore involve the monitoring of both abiotic and biotic variables by the Biosphere Office or other stakeholders. The research may provide a basis for the initiation of a project or form part of the work. The project is part of the overall action plan, but it also contributes to the development of new action plans.

A summary is presented below of the main projects that have been carried out at the biosphere reserve where the research, monitoring and follow-up has developed the biosphere activities.

Abiotic and biotic research and monitoring

Recipient control of the River Helge å (both abiotic and biotic monitoring)

Regular recipient controls (sampling) of lakes and watercourses in the River Helge å catchment area are carried out on behalf of the Committee for the coordinated management of the River Helge å. The committee comprises the various municipalities along the River Helge å catchment area, together with the major operators. The physical and chemical properties of the water and the presence of metals are being studied in the sampling programme. Biological parameters are also being investigated. In the case of lakes, this includes phytoplankton, zooplankton, fish, diatoms and bottom fauna, in addition to fish in watercourses. This form of control is used to detect changes in the aquatic environment, and may result in targeted measures being implemented under Kristianstad Municipality's nature conservation programme. The results of the recipient controls are published in an annual report, which is available on the municipal authority's website.

Western Hanöbukten Bay Water Conservation Association

Western Hanöbukten Bay Water Conservation Association is an association which comprises seven municipalities, two industries, three watercourse associations and one port. The aim of the association is to monitor the environment in the Western Hanöbukten bay area. The monitoring includes survey fishing, bottom fauna, plankton and water chemical analyses. The work is being carried out in close contact with Blekinge Water Conservation Association (*Blekingekustens vattenvårdsförbund*), which covers the Blekinge area of Hanöbukten bay. The programme is being carried out in consultation with the authorities which are responsible for supervision in accordance with the Swedish Environmental Code. The programme will provide a basis for planning, measures and monitoring of the environment in the Western Hanöbukten bay area and its associated catchment area.

Research and monitoring with a focus on biodiversity

River Helge å, wetland area and Hanöbukten bay lakes

The wetland area and the lakes have been focus areas since the activities relating to Kristianstads Vattenrike began back in 1989. Environmental changes have occurred in various parts of the biosphere reserve over the past ten years. One marked change is that the water has become significantly browner in the River Helge å. This development is not specific to the River Helge å, as many watercourses and lakes in Northern Europe have become browner in recent decades. The water now has a strong brown colour throughout most of the River Helge å catchment area from its source to its mouth. The water discolouration and humus content have increased markedly throughout the catchment area, and the brown colour of the water continues out from the mouth of the River Helge å and along the beaches of the Hanöbukten bay area. Most of the humus colour in the areas of the biosphere reserve concerned originates from the northern forested part of the catchment area.

Discolouration of the water has increased markedly in recent decades and discolouration levels are now as high as 200 mg P/l. Large areas of Lakes Hammarsjön and Araslövssjön were previously covered by Common reeds (*Phragmites australis*) and Common clubrush (*Schoeneoplectus lacustris*) and there were major concerns that the lakes would become completely overgrown. The common clubrush has now largely disappeared, and the common reed has also declined. A number of causes for this decline have been discussed. Possible explanations are: the large number of Greylag geese (*Anser anser*) in the lakes grazing on the common clubrush and common reed, brownification and steadily decreasing phosphorous input in watercourses.

A significant part of Kristianstads Vattenrike Biosphere Reserve consists of marine environments in the Hanöbukten bay area. The coastal area in Kristianstad is a very important resource for tourism, residents and outdoor recreation. It is estimated that tourism boosts the municipality's economy by SEK 500 million annually. In recent years, many people working and living along the coast believe that the coastal environment has deteriorated dramatically. Commercial fishermen have reported cases of injured fish and large amounts of algae being caught in fishing nets. As part of Kristianstad's 400th anniversary celebrations, the Biosphere Office, together with the Environmental and Health Protection Office and City Planning Administration, decided to focus on the municipality's shallow marine areas. Marine issues have been highlighted during the year through the knowledge project Sea Journey (Havsresan), during which over 40 divers examined Hanöbukten bay in the Åhus area over the course of a week in May. In addition, Marine Days have been arranged with exhibitions, activities and breakfast meetings, together with the municipality's business office. Naturum Vattenriket visitor centre has hosted around a dozen lectures on the various values of marine areas.

The Biosphere Office and the Environmental and Health Protection Office has addressed various aspects of marine areas. The Biosphere Office has appointed a marine biologist to repeat an inventory of eelgrass meadows performed in 2004. Eelgrass meadows (*Zostera marina*) are very important biotopes in shallow marine areas, and are important locations for juvenile fish species and bottom fauna. Eelgrass meadows also provide protection against erosion, which is a topical issue in Kristianstad. The inventory was prepared with funding from the Swedish Agency for Marine and Water Management as part of the project entitled 'A better balance in the Hanöbukten bay area' (*Bättre balans i Hanöbukten*). It was very pleasing to see that the municipality is home to some fantastic environments in its shallow marine areas. It is likely that the large eelgrass meadows extend all the way from Åhus to Ålahaken on the northern boundary of the municipality and out to the shallow banks of Lägerholmen. It is important to protect and conserve these environments for future generations in the municipality of Kristianstad.

Documentation of the biological value of sandy grasslands (monitoring)

The Biosphere Office started working on the theme area of sandy cultivated grasslands in 2006. Work began on documenting the area's biological values in order to acquire knowledge as a basis for future action programmes. Experts and researchers prepared inventories concerning solitary bees, gasteromycetes, vascular plants, etc. The inventory is followed up annually and the knowledge acquired has been used to focus restoration, development and conservation measures on the most appropriate areas. The results of the inventories are published in the periodical 'Vattenriket in focus' (*Vattenriket i fokus*).

Bird inventories and bird counts (monitoring)

Inventories have been prepared for many bird species under the direction of a number of stakeholders over the past ten years. A description is given below of the inventories most closely linked to the biosphere activities:

Goose counts: An annual count of resting geese is performed during the winter months by the Bird Society of North-East Scania (*Nordöstra Skånes Fågelklubb*) (since 1976). The results of these counts indicate strong trends in the populations of several species of geese and this has provided an important basis for the joint work relating to the management of geese on the Kristianstad plain with the aim of reducing damage to farm crops. Flight inventories have

been performed on a regular basis in order to monitor the development of breeding greylag geese.

Crane counts: Cranes (*Grus grus*) are counted every two to three days at the roosting site at Pulken Outdoor Museum in order to gain an understanding of the numbers of cranes resting in the countryside during the spring. The counts are performed by the Bird Society of North-East Scania (Nordöstra Skånes Fågelklubb) and form part of the work to prevent damage being caused by the cranes. When farmers have started sowing and crane numbers are high, the birds are fed in a special field at the outdoor museum. This minimises the damage caused to all other fields in the area, and enables the cranes to feed undisturbed, which in turn also enables many visitors to experience the cranes at close range.

Inventories of wet grassland birds and land maintenance: Wet grassland birds, especially certain species of wading birds and ducks, have been monitored since the activity first began in 1990. From populations that were initially declining, numbers have risen as a result of restoration measures implemented through cooperation between landowners, livestock farmers and the Biosphere Office. A number of species have started to decline in recent years, and various studies are now being conducted in an attempt to understand the reasons why and enable measures to be taken.

Regular land management surveys have been performed since 1996 because management is important for the wet grasslands and the conservation of biodiversity. The most recent survey dating from 2008 indicates that the proportion of managed land has risen since the work relating to Kristianstads Vattenrike began, and also since the area became a biosphere reserve.

Ecosystem services (research)

Stockholm Resilience Centre conducted a pilot study in an ecosystem service analysis of the area's wet grasslands as part of a stronger focus on the biosphere reserve's ecosystem services. The aim of the study was to map the ecosystem services provided by the wet grasslands and to develop an appropriate method of analysis. The results indicated that there are a number of threats to the wet grasslands. These are dependent on a certain type of management (grazing and mowing) and annual inundation for the continued generation of ecosystem services and in order to maintain the resilience of the ecosystem. This has been taken into account in the biosphere reserve's individual action programme and in the municipality's overarching nature conservation programme. The study was published as a report to the Swedish Environmental Protection Agency and in the periodical 'Vattenriket in focus' (*Vattenriket i fokus*).



Photo: Sven-Erik Magnusson

Catfish are back in the River Helge å. Survey fishing shows that releases have been successful.

The European catfish (*Silurus glanis*) was a common fish in the River Helge å in the past. The species disappeared in the 1960s due to pollution. The water quality has now improved, and European catfish were released into the river in 1999, 2011 and 2012. The European catfish is a selected species in the national work to conserve threatened species. The Biosphere Office has carried out survey fishing over the past four years to find out how many European catfish there are at present. This survey fishing indicates that the

European catfish has once again become established in the Lower River Helge å. However, genetic analyses indicate that only a few catfish have spawned. Therefore, it is important to follow-up the development of the population.

Other species of fish were also caught in the survey fishing for European catfish. Thus, the monitoring of European catfish has also resulted in knowledge being acquired concerning other species. This knowledge can be used as a basis for measures for other species.

Survey fishing and monitoring of European catfish (monitoring)

Standardised survey fishing for European catfish (*Silurus glanis*) has been conducted annually in the River Helge å since 2011. Standardised survey fishing was introduced to allow objective analysis of the population status in the Lower River Helge å, and has subsequently been expanded to include upstream locations along the River Helge å in the county of Skåne. The data generated has been used to compare fish stock levels from year to year and to make comparisons with other watercourses. Fin samples were also taken in connection with each round of survey fishing. The fin samples were sent to the Swedish University of Agricultural Sciences (SLU) for analysis and to enable the population size to be calculated.

The European catfish is threatened with extinction and data from the samples will be used in a European catfish action programme, which will be developed by the Swedish Agency for Marine and Water Management. The work in connection with monitoring and survey fishing for European catfish is carried out under the direction of the Biosphere Office and in consultation with the County Administrative Board of Skåne, which has also part-financed the project. The results have been published as reports in 'Vattenriket in focus' (*Vattenriket i fokus*), and have also led to a thesis.

Other species of fish were also caught during the survey fishing for European catfish. Thus, the monitoring of European catfish has indirectly led to the monitoring of other species in the same locations. The other species that have been caught have also been documented and may be used as a basis for future measures.

A better balance in the River Helge å and the Hanöbukten bay area (research and monitoring)

During the summer of 2014, an inventory of the seabed was initiated in the Hanöbukten bay area and along the coast of the municipalities of Kristianstad, Bromölla and Simrishamn. This forms part of the project entitled 'A better balance in the River Helge å and the Hanöbukten bay area', which is a cooperation between the County Administrative Board of Skåne and Kristianstad Municipality, with the Biosphere Office acting as coordinator. The main goal of the project is to safeguard biodiversity and management of marine areas as a resource. The project has been divided into 12 sub-goals in order to achieve this. The inventory of the Western Hanöbukten bay area forms part of the first sub-goal and focuses on increasing the level of knowledge relating to the seabed. The inventory will be carried out regularly during the course of the project, and areas with high natural values will be integrated in the municipality's nature conservation strategies.

Integrated management and research

Much of the above mentioned research and monitoring also comes under this heading. This applies to monitoring and inventories in the wetland areas and other watercourses, as these can be considered to be included in the river basin (see category in Annex I).

Multidisciplinary studies (research)

Stockholm Resilience Centre has conducted a number of multidisciplinary studies during the ten-year history of Kristianstad Vattenrike Biosphere Reserve. Studies have for example been conducted relating to the following:

- How local decision-makers affect the management and development of different natural areas;
- The emergence of ecosystem-based management;
- The ecosystem services provided by the wet grasslands;
- The way in which brownification has affected landscapes downstream and their ecosystem services;
- Kristianstads Vattenrike Biosphere Reserve has been included as part of a wider study looking at 146 biosphere reserves. There has been a focus on the way in which the local population could influence ecosystem management.

Studies of the tourism economy (monitoring)

Studies of the tourism economy were conducted in 2011 and 2013, with the aim of understanding what visitors to the biosphere reserve had added to Kristianstad Municipality in economic terms. The study is described under article 5.4.

6.3 Describe how traditional and local knowledge and knowledge from relating to management practices have been collected, synthesized and disseminated. Explain how such knowledge is being applied to new management practices, and how and if it has been integrated into training and educational programmes.

Close contact and dialogue with local stakeholders (landowners, users, associations and residents, etc.) are an essential aspect in the work of the Biosphere Office. Local stakeholders are always contacted in connection with the start-up of new projects to obtain their knowledge, experience and consent. Traditional knowledge often provides an indication of the appropriate current measures to conserve and develop biodiversity.

This knowledge is disseminated to the general public through information on the biosphere reserve website, signs at the project site and outdoor museums, during seminars at the visitor centre, field tours in the landscape and through the work of the biosphere ambassadors. The information is also disseminated to local stakeholders and decision-makers within the Consultation Group. In addition, the information is also incorporated in the environmental education work of the visitor centre and in the training of biosphere ambassadors, and in a number of several cases has been disseminated to researchers, who used the knowledge as a basis in research projects.

A good example to illustrate this is the work relating to the sandy grasslands around Åhus and Sånarna Outdoor Museum. Clear threats have been identified in the form of demand for land for development and business, intensive cultivation and land gradually becoming overgrown. Sandy grasslands have been highlighted as a prioritised thematic area in the work of the Biosphere Office in order to conserve and develop the considerable natural values of the area. Local landowners were interviewed by the Biosphere Office's ecologist prior to the start of the project. These interviews provided knowledge about the area and created a starting point for subsequent dialogue. Appropriate measures and management that both conserves the high natural values and supports land owners were discussed. Experts and researchers were engaged to prepare species inventories and to increase the level of knowledge. A 'think tank' was set up, where landowners, researchers, experts and expert officials discussed how we could work together to conserve and develop the very high natural values of sandy grasslands.

The Biosphere Office was awarded funding by the County Administrative Board for restoration projects. Pine saplings were cleared on cultivated land and grazing was reintroduced on pasture at Lyngsjö, which is the only place in the country where the unusual plant species *Minuartia viscosa* is found. Benevolent landowners also saved and incorporated old oak posts into the new fence for the Ripa Field in order to conserve the rare species *Cyphelium trachylioides*. The sandy grasslands around Åhus has also been included in a research project at Lund University concerning restoration of the xeric sand calcareous grassland which is under threat.

Sånarna Outdoor Museum was opened in 2006 to disseminate the knowledge that had been acquired concerning sandy grasslands amongst the general public. A demonstration cultivation for an old species of rye was started in the Sånarna area to illustrate and conserve the area's traditional rotation system of cultivation and fallow. An outdoor classroom was created adjacent to the outdoor museum with basic field equipment and educational materials for teachers and pupils. A national conference on the high natural and cultural values of sandy grasslands was held in 2008 together with the County Administrative Board and Studieförbundet (a study association). The conference attracted a large number of delegates from across the country.

6.4 Environmental/sustainability education. Which are the main educational institutions (“formal” – schools, colleges, universities, and “informal” services for the general public) that are active in the biosphere reserve? Describe their programmes, including special school or adult education programmes, as these contribute towards the functions of the biosphere reserve. Comment on organizational changes (if any) in institutions and programmes that were identified in the biosphere reserve ten or so years ago (e.g. closed down, redesigned, new initiatives). Refer to programmes and initiatives of UNESCO Associated Schools networks, UNESCO Chairs and Centers where applicable.

A list of the main education institutions and the programmes specifically relating to the biosphere activities is presented below:

Education through the biosphere reserve's own activities

Naturum Vattenriket serves as a visitor centre and meeting place for Kristianstads Vattenrike Biosphere Reserve. The visitor centre was opened following an architectural design competition and construction in 2010, as a direct consequence of the decision by UNESCO to designate Kristianstads Vattenrike as a biosphere reserve. There are around 30 Naturum visitor centres in Sweden, all designated by the Swedish Environmental Protection Agency, with the aim of increasing awareness about nature and nature conservation in an inspiring way and acting as a gateway to a specific natural area. Naturum Vattenriket visitor centre has had more than 500,000 visitors since it first opened in 2010.

The visitor centre is home to an exhibition full of experiences to lead the way out into the biosphere reserve. Naturum Vattenrike visitor centre is staffed by experts from the Biosphere Office. Visits from school classes form an important part of the visitor centre's work. A full-time nature educator meets the needs of schools and takes approximately 100 classes per year.

A biosphere camp is held for 30 schoolchildren aged 10-14 during the summer holidays. The children learn about nature and mankind over a period of two weeks by experiencing, discovering and investigating the biosphere reserve. Young people aged 16-17 work as assistant leaders at the biosphere camp during the school holidays. In this way, knowledge of the biosphere reserve is also disseminated to these people.

The Biosphere Office began training biosphere ambassadors in March 2013. These ambassadors will disseminate interest in and knowledge of Kristianstads Vattenrike Biosphere Reserve amongst colleagues, friends, customers, family and associations. This training is aimed at adults. A total of 130 biosphere ambassadors have so far been trained.

The Biosphere Office also takes on trainees at various educational levels, e.g. from compulsory primary and lower secondary, upper secondary and higher education.



Biosphere camps give children enjoyable and educational experiences during the summer holidays in the biosphere reserve

The Biosphere Office offers a Biosphere Camp for schoolchildren aged 10-14 during the summer holidays. Around 30 children learn more about man and nature over a period of two weeks by experiencing, discovering and investigating. The Biosphere Camp is aimed at children who like to be outdoors. The camp has a special theme every year.

The Naturum Vattenriket visitor centre offers educational activities for school classes in the municipality during the rest of the academic year. The visitor centre's nature educator and the Biosphere Office's limnologist also work together on educational ecological projects in the landscape with a number of schools.

Higher education

Kristianstad University is the most important hub for higher education due to its location in the middle of the biosphere reserve. The university has 14,000 students from across Sweden, Europe and the rest of the world. The university offers education programmes and courses with a direct focus on the environment and sustainability at undergraduate, graduate and research levels. The Landscape Science Programme is an example of an education programme where the biosphere reserve plays a key role. This is an interdisciplinary programme where natural science is interwoven with social sciences and humanities in order to teach students about how the landscape has changed from the Ice Age through to the present.

Stockholm Resilience Centre (part of Stockholm University) the Swedish University of Agricultural Sciences (SLU) and Lund University use Kristianstads Vattenrike Biosphere Reserve in connection with advanced level courses in order to illustrate adaptive co-management and sustainable development.

6.5 How do you assess the effectiveness of actions or strategies applied?

(Describe the methods, indicators).

The long-term communication work of the Biosphere Office involves creating a change in attitudes towards sustainable development, which is good for both nature and mankind. That the Swedish Environmental Protection Agency and the politicians of Kristianstad decided to build Naturum Vattenriket visitor centre is evidence of the fact that attitudes towards

Kristianstad's wetland areas have changed from viewing them merely as waterlogged areas to being rich wetlands.

The focus on Naturum Vattenriket visitor centre has proved to be far more successful than could ever have been hoped for. Prior to its construction, it was estimated that the visitor centre would attract 40,000 visitors per year. The visitor centre attracted 160,000 visitors in its first year and has had over 100,000 visitors per year since then.

The Biosphere Office's work relating to the visitor centre and visitor sites have been the subject of scientific studies. Thomas Beery, guest professor at Kristianstad University, has conducted a 'place-attachment study' for the visitor sites of the biosphere reserve and a study of the visitor centre as a 'gateway to Vattenriket'. The studies indicated that the visitor centre and visitor sites together fulfil the biosphere reserve's communication goal that its visitors should feel a connection to the area and want to learn more about the biosphere work. These are important prerequisites in bringing about a change in attitudes towards sustainable development.

Naturum Vattenriket acts as a showcase for the work of the Biosphere Reserve and as a visitor centre that guides its visitors around the area's 21 visitor sites. The biosphere reserve has 150,000 visitors per year. The number of visitors to the biosphere reserve's website and Facebook page is measured continuously. The website has around 300,000 visitors per year from 120 countries. The Facebook page has 1,700 followers. There are around 200 media reports on the biosphere reserve each year.

6.5.1 Describe the biosphere reserve's main internal and external communication mechanisms/systems

The Biosphere Office works to disseminate information and engagement in relation to Kristianstads Vattenrike Biosphere Reserve as:

1. A model area for sustainable development that works on behalf of UNESCO with the three functions of conservation, development and logistic support;
2. An exciting visitor destination with Naturum Vattenriket visitor centre and its programme activities and educational activities as a starting point for excursions to the 21 visitor sites in the area.

The communication is aimed at many different target groups with different levels of previous knowledge and roles: the general public, associations and companies, school classes and families with children, university college and university students, teachers and researchers, visitors, decision-makers, civil servants and the media. The aim is to appeal to both hearts and minds with a message that is more about 'love' than 'loss', preferably using humour as a tool according to the 'fun theory'. The Biosphere Office uses many different channels to do this: information in the landscape, the website and Facebook, folders, brochures, reports and books, audio guides and films, contact with the media and marketing.

Internal communication:

Communication within the Biosphere Office and with other employees in Kristianstad Municipality takes place via meetings, email, the intranet and joint appointment calendars. Inter-municipal ecologist meetings and management councils are held every other week.

External communication:

Websites and social media

The website for the biosphere reserve is the most important channel for external communication. This contains information regarding operations, news, activities, visitor information and facts about animals and nature. The website was set up in 1995. It has around 300,000 visits annually made by 125,000 people from 120 countries. The main language is Swedish and some pages have been translated into English. Information on the biosphere reserve can also be found on the Kristianstad Municipality website and on the Swedish MAB website.

Social media are also key elements in external communication. We provide information on current projects and activities at the visitor centre on our Facebook page. Visitors are encouraged to 'tag' #Vattenriket on Instagram. In this way, visitors become involved by taking pictures in the biosphere reserve and spreading tips on good natural experiences and exciting activities.

The visitor centre, visitor sites and signs

Naturum Vattenriket visitor centre was opened in November 2010, which provided Kristianstads Vattenrike with a physical meeting place to disseminate information regarding the biosphere work and the value of the landscape.

The biosphere reserve also contains 21 visitor sites with information in the form of signs and exhibitions, which are made accessible by marked paths and adaptations. The visitor sites are a way of disseminating information concerning the high natural and cultural values of the biosphere reserve. Brown and white tourist signs are used at the main entry points to the reserve in order to make the biosphere reserve more obvious.

Visitors are welcomed to visitor sites by 'welcome signs', paths, birdwatching towers and information concerning the site's natural and cultural values. Five of the visitor sites have been highlighted as outdoor museums, with more developed information, audio files, film clips and three-dimensional figures.

'QR codes' are used on information signs to make it easier for smartphone users to access audio guides, film clips or text and images from the website. In addition to the visitor sites, the Biosphere Office uses special project signs to tell people about ongoing restoration projects in the landscape.

Printed materials:

The Biosphere Office produces printed materials in the form of folders, maps, brochures and guidebooks. These make it easier for people with an interest in nature to experience the biosphere reserve, and provide information about the biosphere activities. The Biosphere Office prepares a report on its work every year which is printed and published on the website. In addition to this, there are various reports and inventories in the written publication 'Vattenriket in focus' (Vattenriket i fokus).

Media:

Newspapers and specialist media are important communication channels, as is Kristianstad Municipality's own 'Kristianstad periodical' (*Tidningen Kristianstad*), which is distributed to all households in the municipality. Press releases and press invitations are held several times a year. More than 200 articles are published on the biosphere reserve annually.

Other communication:

Subject specific information is also disseminated through seminars, conferences, workshops and theme days in the landscape or at the visitor centre. These take place in a dialogue with interested parties and stakeholders both prior to start-up and during a project. Information is provided via email, letter, personal meetings, notices and signs. Meetings are held with the biosphere reserve's Consultation Group three times a year. In addition, the Biosphere Office meets biosphere ambassadors and Friends of Vattenrike (Vattenrikets vänner) several times a year.

6.5.2 Is there a biosphere reserve website? If so, provide the link.

Yes: www.vattenriket.kristianstad.se

6.5.3 Is there an electronic newsletter? How often is it published? (provide the link, if applicable).

News articles are published in a news blog several times a week on the biosphere reserve's website. www.vattenriket.kristianstad.se/blogg The posts describe the work being carried out in the biosphere reserve and are aimed at anyone who is interested in the biosphere reserve. It is possible to subscribe to news articles and posts marketed via the Vattenrike Facebook page. The language used is Swedish and news posts can be easily translated in the blog using Google Translate.

Naturum Vattenrike visitor centre distributes a weekly newsletter with information on relevant activities. The newsletter is distributed to members of the 'Friends of Vattenrike' association. The Biosphere Office distributes newsletters to Friends of Vattenrike, biosphere ambassadors, other biosphere reserves, Swedish MAB, the Consultation Group, decision-makers and politicians. The newsletter is published quarterly.

6.5.4 Does the biosphere reserve belong to a social network (Facebook, Twitter, etc.)? Provide the contact.

Facebook: www.facebook.com/NaturumVattenriket. The Facebook page was set up in connection with the opening of the Naturum Vattenrike in 2010 and has around 1,700 followers. **Instagram:** User is 'Vattenriket', with the option for visitors to #vattenriket. **Flickr:** The Biosphere Office uses Kristianstad Municipality's Flickr account, www.flickr.com/photos/kristianstadskommun/collections, under Vattenriket and the visitor centre. Flickr is used to publish press images and the Flickr address can be found on the Vattenrike website under 'Pressinfo'.

6.5.5 Are there any other internal communication systems? If so, describe them.

Meetings with other departments in Kristianstad Municipality, the County Administrative Board, Kristianstad University and other associations are held as required to supplement the regular meetings mentioned previously.

The biosphere reserve aims to be a resource for the municipality in the work relating to tourism development, outdoor recreation, town planning and environmental development. Internal communication takes place with the municipal departments concerned in connection with this. The Biosphere Office is also an important party in developing Kristianstad

Municipality's overall climate-related communication. The Biosphere Office is also involved in the County Administrative Board's Consultation Group for nature management.

6.6 Describe how the biosphere reserve currently contributes to the World Network of Biosphere Reserves and/or could do so in the future.

Biosphere Office staff have also participated in a number of EuroMAB conferences, and given lectures at some of these conferences. Meeting representatives from other biosphere reserves and exchanging experience and knowledge is very rewarding and developmental.

We would like to share our experiences and good examples from our activities. Prior to EuroMAB in Estonia, we announced our interest in providing information about our use of information and work to change attitudes based on a positive perspective for disseminating knowledge and generating interest and commitment.

6.6.1 Describe any collaboration with existing biosphere reserves at national, regional, and international levels, also within regional and bilateral agreements.

The Swedish biosphere reserves have a well-developed cooperation both amongst themselves and with Swedish MAB. Representatives of the Swedish biosphere reserves meet at least once a year for workshops and conferences, at which experiences and information concerning biosphere activities are exchanged. There are often exchanges between Kristianstads Vattenrike Biosphere Reserve and other Swedish biosphere reserves. The Biosphere Office participated in a study visit to Blekinge Archipelago Biosphere Reserve and met the coordinator and other stakeholders in autumn 2014. This provided valuable knowledge and inspiration.

The Biosphere Office's activities have been of vital importance in the establishment of other biosphere reserves in Sweden. Vattenrike was the first biosphere reserve in accordance with the Seville Strategy and has therefore acted as a model area for the other biosphere reserves. The Biosphere Office has contributed information and advice regarding both the application process and potential activities in a biosphere reserve.

The nearest biosphere reserve is the Blekinge Archipelago, and information and knowledge are exchanged between our two biosphere reserves (see section above).

The Biosphere Office has a partnership with the Schaalsee Biosphere Reserve in Germany. Staff from Kristianstads Vattenrike have made visits to Germany and representatives from Schaalsee have visited Vattenrike Biosphere Reserve.

6.6.2 What are the current and expected benefits of international cooperation for the biosphere reserve?

Being able to benefit from good examples and be inspired by the sustainable development work of other biosphere reserves is invaluable. One example from the most recent EuroMAB meeting in Canada is the branding work that is being carried out within the global network. We were also inspired by excellent examples of cooperation together with volunteers in various contexts. This is something that has not been done to any great extent in Sweden, but is certainly something we are interested in developing.

6.6.3 How do you intend to contribute to the World Network of Biosphere Reserves in the future and to the Regional and Thematic Networks?

We want to share our experiences and good examples from our work. Prior to EuroMAB in Estonia, we announced our interest in providing information about the way we are using information and changing attitudes based on a positive perspective for disseminating knowledge and generating interest and engagement.

We will continue to participate in EuroMAB, NordMAB and national MAB meetings. Our working methods build on adaptive co-management, as described previously in this document. This, together with our work to change attitudes, is one example of our activities where we will gladly share our knowledge with the global network.

6.7 What are the main factors that influenced (positively or negatively) the success of activities contributing to the logistic support function? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be favored as being most effective?

Interest in Kristianstads Vattenrike Biosphere Reserve has steadily increased during the past ten years. The single most important factor was the decision by the politicians of Kristianstad and the Swedish Environmental Protection Agency to build Naturum Vattenrike visitor centre as a showcase, visitor centre and meeting place for the biosphere reserve. The visitor centre opened in 2010 and has welcomed more than 500,000 visitors since then. The growing interest in our work has also led to new contacts with educational institutions and researchers, both in Sweden and abroad. Modern IT technology has played a key role in the dissemination of information and the work to make nature accessible through visitor sites which offer more opportunities to experience and understand natural and cultural values in the landscape.

The website: The website is a crucial factor in the support function. All information concerning the biosphere reserve has been collated here since 1995.

Social media: The Biosphere Office uses social media to achieve two-way communication at a low cost. Facebook and Instagram are channels where interested people can disseminate information about Kristianstads Vattenrike Biosphere Reserve by liking, sharing and commenting.

Medial contacts: The Biosphere Office works actively with press releases, press invitations and tips to get the media interested in what is happening in the reserve. The Biosphere Office recruited a journalist in 2010, who is an asset with regard to media contact.

Visitor sites in the landscape: The visitor sites in the biosphere reserve help Kristianstad residents and visitors to enjoy and take an interest in the landscape. At these sites, we tell people about the high natural and cultural values of the sites. The sites give a feel of the reserve and generate curiosity about the work being carried out in the biosphere.

Naturum Vattenriket visitor centre: Naturum Vattenriket visitor centre has provided the Biosphere Office with a showcase for the activities and serves as a meeting place for many different target groups.

Natural- and cultural heritage interpretation paths: The Biosphere Office works with self guided paths and new technology in the landscape. A description of the technical solutions

used to supplement the self guided paths in the biosphere reserve can be found on the website. The website, QR codes, audio files, webcams, video cameras used for education and U-Turn Rounds are some examples of this. <http://www.vattenriket.kristianstad.se/projekt/teknik.php>

Accessibility: The Biosphere Office is actively working to improve access at the reserve's visitor sites. Five visitor sites were made more accessible for the disabled during the period 2006 to 2009. Wide trails and boardwalks are examples of adaptations to facilitate wheelchair and pushchair access. This work has been carried out in consultation with users in order to meet their needs and desires.

Research: Research is being conducted within various fields by university colleges, universities and government institutions. The biosphere reserve and biosphere operations attract researchers from other parts of the world and the reserve has been referred to in a number of international scientific periodicals.

Kristianstad University is the most important node for higher education in the biosphere reserve. Stockholm Resilience Centre (part of Stockholm University), the Swedish University of Agricultural Sciences (SLU) and Lund University are institutions that use Kristianstads Vattenrike Biosphere Reserve as an example and study object in connection with advanced level courses. Many research and monitoring programmes have been carried out over the past ten years that have assisted in developing the biosphere activities.

6.8 Other comments/observations from a biosphere reserve perspective.

The Biosphere Office is working to improve access at visitor sites and to provide information concerning the biosphere reserve for everyone. Wide trails and boardwalks make it easier for wheelchairs and pushchairs to move around. These adaptations have been made in consultation with users in order to best meet their needs and desires.

7. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION

[Biosphere reserve coordination/management coordinators/managers have to work within extensive overlays of government bodies, business enterprises, and a “civil society” mix of non-governmental organizations and community groups. These collectively constitute the structures of governance for the area of the biosphere reserve. Success in carrying out the functions of a biosphere reserve can be crucially dependent upon the collaborative arrangements that evolve with these organizations and actors. Key roles for those responsible for the biosphere reserve coordination/management are to learn about the governance system they must work within and to explore ways to enhance its collective capacities for fulfilling the functions of the biosphere reserve.]

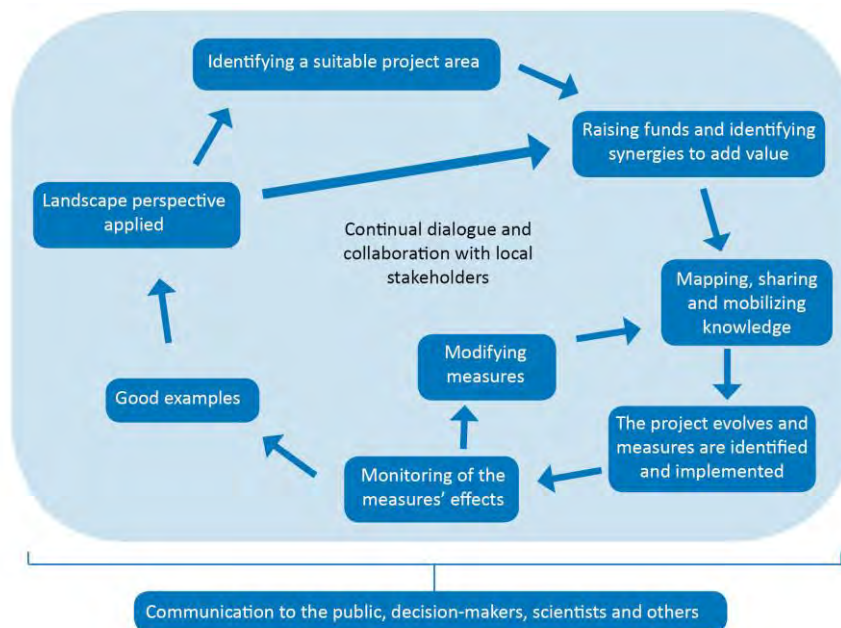
7.1 What are the technical and logistical resources for the coordination of the biosphere reserve?

Kristianstad Municipality is the responsible authority for Kristianstads Vattenrike Biosphere Reserve. The Biosphere Office and visitor centre belongs to the Municipal Executive Office. The Biosphere Office has 13 full-time equivalents. These are responsible for activities in the biosphere reserve. The work takes place in close cooperation with several other municipal administrations and with the County Administrative Board of Skåne.

7.2 What is the overall framework for governance in the area of the biosphere reserve? Identify the main components and their contributions to the biosphere reserve.

The management structure of the biosphere reserve may be described as adaptive co-management (see figure below). This means that the management is carried out in cooperation with the stakeholders concerned. The Biosphere Office is responsible for coordinating the work in the biosphere reserve to ensure that it fulfils the three functions of the biosphere reserve. The office coordinates activities in the area and supports, initiates and follows up activities performed by other stakeholders within the framework of the biosphere reserve's action plan.

The Biosphere Office has no official authority. Instead, the work takes place through a close and good dialogue with authorities, associations, landowners and other stakeholders for the various projects being carried out by the Biosphere Office, in addition to meetings with the biosphere reserve's Consultation Group. The Consultation Group consists of representatives from several stakeholders in the biosphere reserve and acts as an advisory group. Meetings are held three times a year and provide an excellent arena for early discussions and dialogue regarding various matters.



The management structure of the biosphere reserve can be described as adaptive co-management.

7.3 Describe social impact assessments or similar tools and guidelines used to support indigenous and local rights and cultural initiatives (e.g. CBD Akwé:Kon guidelines, Free, Prior, and Informed Consent Programme/policy, access and benefit sharing institutional arrangements, etc.).

This question is not relevant to Kristianstads Vattenrike Biosphere Reserve. No indigenous peoples live in the reserve.

7.4 What (if any) are the main conflicts relating to the biosphere reserve and what solutions have been implemented?

There are no major conflicts in Kristianstads Vattenrike Biosphere Reserve. Any previous conflicts have been related to exploitation, land use and water extraction (see under question 7.4.1 for further information).

7.4.1 Describe the main conflicts regarding access to, or the use of, resources in the area and the relevant timeframe. If the biosphere reserve has contributed to preventing or resolving some of these conflicts, explain what has been resolved or prevented, and how this was achieved for each zone?

Kristianstad Municipality is part of an expanding region with increasing exploitation and intensive agriculture. This has led to certain situations where there are conflicting interests in the biosphere reserve's development areas, for example between agriculture and nature conservation and regarding the way in which groundwater should be used. The Biosphere Office has helped to create agreement by promoting an ongoing dialogue between the various stakeholders.

The work in connection with crane and goose management is a good example of how cooperation and dialogue can lead to excellent solutions for all parties concerned. Cranes were previously the cause of problems because resting cranes during the spring had a tendency to destroy spring crops on farms (see question 4.2 for further details). The crane group was initiated in 1997 by what is now the Biosphere Office in order to create a platform for

dialogue between the various stakeholders. The aim of this group was to find a solution to the problem so that the cranes could rest undisturbed in the biosphere reserve without damaging spring planting. The activity had already been established prior to the nomination to become a biosphere reserve, but has been further developed during the past ten years. Future conflicts of interest have been prevented thanks to the crane group and its activities.

The Biosphere Office is also endeavouring to find common ground between exploitation and conservation work to prevent conflicts. Work with the golf course in Åhus illustrates that it is possible to find solutions to benefit diverse interests (see question 4.3). Kristianstad Golf Club wanted to purchase land from Kristianstad Municipality for the construction of a new 18-hole golf course. Kristianstad Municipality was initially reluctant to sell the land to the golf club because of its high natural values. A dialogue was initiated, which resulted in an agreement where the club was permitted to purchase the land on the condition that it would work towards an international environmental certification of the golf course issued by the Golf Environment Organisation (GEO). This agreement was fulfilled by the club. This has also led to a successful cooperation over a number of years to create a multifunctional golf course that promotes the area's high recreational and natural values at the same time as being attractive to play on.



The multifunctional golf course in Åhus combines golf, nature conservation and outdoor activities

The Biosphere Office is working with Kristianstad Golf Club to establish an environmentally certified and multifunctional golf course. The project promotes and makes accessible the high natural value of the area. The club and the Biosphere Office are working together in connection with cultural and nature conservation measures, information and public access. An environmental committee with representatives from the club, a botanist and an ecologist from the Biosphere

Office plan measures in accordance with a management plan for the golf course's cultural and natural values. A trail has been created to encourage active outdoor recreation. Information signs around the golf course and along the trail provide information on the natural and cultural values in the area. The cooperation has resulted in the club being approved in accordance with the international environmental certification of the Golf Environment Organisation (GEO) in 2011.

7.4.2 Describe any conflicts in competence among the different administrative authorities involved in the management of the area comprising the biosphere reserve.

The Biosphere Office has no official authority. Instead it acts as an arena for discussions and can assist by providing knowledge in cases such as those concerning planning work and the development of areas with natural values in cases where other interests are also present. A good example of this is the sandy grasslands to the west of Åhus, which were of particular development interest due to their attractive location, yet at the same time the land was of high natural and cultural value. As a result of the Biosphere Office's work to raise awareness and ensure a good dialogue at an early stage in the processes relating to the municipal comprehensive plan, the land could be re-designated from development land to a natural area, and has now also been a municipal nature reserve for a number of years.

7.4.3 Explain the means used to resolve these conflicts, and their effectiveness. Describe its composition and functioning, resolution on a case-by-case basis. Are there local mediators; if so, are they approved by the biosphere reserve or by another authority?

As mentioned previously, co-management and dialogue with various stakeholders is the key to both resolving and preventing conflicts. The Consultation Group performs an important function by bringing together representatives for various stakeholders in the biosphere reserve and discussing and exchanging knowledge and information. A greater level of understanding can be created prior to decisionmaking through the exchange of knowledge and the potential to influence. Also important is a dialogue and knowledge exchange, for example with landowners when new projects are initiated or new management proposals are developed.

The problem regarding cranes was resolved by the Biosphere Office bringing together farmers and representatives from ornithological associations in the area. An understanding was created between the stakeholders through dialogue. This creates the requisite conditions for finding a solution favourable to everyone.

The management and subsequent protection of the wet grasslands is another example for which a good solution was developed thanks to the biosphere work. It is crucial for the work that the Biosphere Office creates a good dialogue and that many stakeholders in the area have confidence in the organisation and its staff. The work builds on good examples, which are then subsequently expanded to cover larger areas. Local anchoring and dialogue with government authorities (County Administrative Boards, Swedish Environmental Protection Agency, Swedish Ministry of the Environment) is crucial in order for the work to be successful. There are no local mediators other than the work undertaken by the Biosphere Office staff.

7.5 Updated information about the representation and consultation of local communities and their participation in the life of the biosphere reserve:

7.5.1 Describe how local people (including women and indigenous people) are represented in the planning and management of the biosphere reserve (e.g., assembly of representatives, consultation of associations, women's groups).

The Biosphere Office's Consultation Group consists of several stakeholders representing a number of different authorities and organisations. The Consultation Group meets three times a year and has an advisory role. Landowners and other persons affected are consulted as required before any new projects commence.

The Naturum Vattenriket visitor centre has a Reference Group consisting of representatives from Friends of Vattenrike (*Vattenrikets vänner*), the Bird Society of North-East Scania (*Nordöstra Skånes Fågelklubb*), the Swedish Society for Nature Conservation, the Study Promotion Association and *Folkuniversitetet*. The Reference Group meets four times a year for cooperation regarding the visitor centre's programme.

Sweden is one of the world's best countries for gender equality, and both men and women have the same potential to participate in the biosphere reserve's activities. The biosphere reserve has no indigenous people who require consideration.

The Consultation Group and the Naturum Vattenriket Reference Group are two examples of groups with a large amount of influence over the activities. The Consultation Group for Kristianstads Vattenrike Biosphere Reserve consists of a group of around 30 people representing various interests in the reserve.

- Federation of Swedish Farmers (LRF), in the Municipality of Kristianstad;
- The Swedish Society for Nature Conservation in Kristianstad;
- Bird Society of North-East Scania (*Nordöstra Skånes Fågelklubb*)
- The Lower river Helge å Fishery Conservation Association (*Nedre Helgeåns Fiskevårdsområde*);
- Köpinge Fishery Conservation Association (*Köpinge Fiskevårdsområdesförening*);
- Kristianstad-Bromölla Game Conservation District (*Kristianstad-Bromölla Jaktvårdsrets*);
- Kristianstad Motor Boat Club (*Christianstads Motorbåtsklubb*);
- Beckhovets Fishery Association (*Beckhovets fiskebods-förening*);
- County Administrative Board of Skåne, Environmental Department;
- Swedish Forest Agency, Southern Götaland;
- County Council Region Skåne, Department of Regional Development
- Tourism entrepreneurs;
- Kristianstad University;
- Kristianstad Queen Bee Club (*Kristianstads Drottningklubb*);
- Friends of Vattenrike (*Vattenrikets Vänner*);
- Eel Academy (*Ålakademin*);
- Regulation Company of the Lower river Helge å (*Nedre Helgeåns Regleringsföretag*);
- River Helge å Water Council (*Helgeåns Vattenråd*).

Kristianstad Municipality:

- Biosphere Office, Civic Department, Municipal Executive Office;
- Land and Development Office (*Mark- och exploateringsenheten*), Municipal Executive Office;
- Local Authority of Environment and Health Protection;
- City Architect Office (*Stadsarkitektkontoret*);
- The Technical Department of Kristianstad (*C4 Teknik*)
- Tourism Strategy, Planning and Strategy Office (*Turismstrateg, Planering och strategienheten*), Municipal Executive Office;
- Culture and Recreation Administration (*Kultur- och fritidsförvaltningen*);
- Municipal Board;
- Environmental and Health Protection Committee (*Miljö- och hälsoskyddsnämnden*).

Members of the Naturum Vattenriket Reference Group:

- Biosphere Office
- Bird Society of North-East Scania (*Nordöstra Skånes Fågelklubb*);
- Swedish Society for Nature Conservation;
- Friends of Vattenrike (*Vattenrikets Vänner*);
- Study Promotion Association;
- Folkuniversitetet adult education association

7.5.3 Indicate whether there are procedures for integrating the representative body of local communities (e.g., financial, election of representatives, traditional authorities).

The Consultation Group has been expanded since 2005 to include new members, and therefore also represents more community groups and stakeholders. The group now includes representatives from the authorities, trade and industry and other organisations.

This expansion has both contributed to, and is a result of, a shift in the focus of the Consultation Group. The initial emphasis was on nature conservation and the work relating to wetland areas, which has now developed into an overall biosphere focus and covers more areas of the biosphere reserve.

The Biosphere Office has had a broad cooperation with the surrounding community in connection with this and has a large contact network as part of both a formal and informal

network. A couple of examples are the support association Friends of Vattenrike and the network of biosphere ambassadors.

The general public can contact the Biosphere Office by telephone, email and post, in addition to via Facebook and Instagram. Information on the Biosphere Office's contact details is available on the website.



Biosphere ambassadors spread joy and knowledge about Kristianstads Vattenrike Biosphere Reserve

The Biosphere Office has been training biosphere ambassadors as part of the work to engage the local population since 2013. Participants get to learn about Kristianstads Vattenrike Biosphere Reserve and the projects that the Biosphere Office carries out. The task of the ambassadors is to generate interest in and disseminate knowledge concerning the biosphere reserve amongst family, friends, colleagues, customers and associations. In this way, they contribute to the support function.

They are also given the chance to become involved in various biospheric conservation projects. A total of 130 ambassadors have so far been trained. In addition, the association 'Friends of Vattenriket' (Vattenrikets vänner) has been established by committed individuals to support the activities. The biosphere ambassadors and Friends of Vattenriket help to raise awareness of the activities of the biosphere reserve in both conserving and utilising the values of the landscape.

7.5.4 How long-lived is the consultation mechanism (e.g., permanent assembly, consultation on specific projects)?

The Consultation Group is permanent and meets three times a year. The crane and goose management group meets twice a year, while the Reference Group for the visitor centre meets four times a year. New cooperation groups are established with relevant stakeholders in addition to this for specific projects that the Biosphere Office is working with.

7.5.5 What is the impact of this consultation on the decision-making process (decisional, consultative or merely to inform the population)?

The Consultation Group primarily has an advisory function. The group receives information and is consulted regarding management of and activities in the biosphere reserve. The group also aims to disseminate knowledge and information between stakeholders in order that this can then be disseminated further.

7.5.6 At which step in the existence of a biosphere reserve is the population involved: creation of the biosphere reserve, drawing up of the management plan, implementation of the plan, day to day management of the biosphere reserve? Give some practical examples.

The general public has participated in the activities in various ways, ranging from the establishment of Kristianstads Vattenrike as a biosphere reserve to the daily management of the reserve.

The initiative to form a biosphere reserve with Kristianstad Municipality as the responsible authority was reached under a broad political agreement and was addressed in Kristianstads Vattenrike's action plan for 2001-2003. The Consultation Group was informed at an early stage. Information, knowledge exchanges and discussions regarding the application also took place for associations, local and regional authorities and organisations. A large emphasis was placed on making the application process transparent. The proposal for the application was distributed for consultation in the spring of 2004 to over 40 authorities, associations, organisations and individuals. The Kristianstad Municipal Council then reached a decision to make an application to become a biosphere reserve with broad political agreement.

The public were given the opportunity to influence the action plan for the biosphere reserve through representation by various interested parties and community groups in the Consultation Group. Discussions are held in the Consultation Group before a new action plan is determined in order that the members of the group have the opportunity to influence the content of the programme.

The core areas and buffer zones are managed by different authorities and 90 percent of the land in the development areas is privately owned. Therefore, the consent of landowners is required in order for the Biosphere Office to influence the management and development of the latter. By having a close dialogue and highlighting good examples, the Biosphere Office has promoted a knowledge exchange and has been successful in convincing landowners of the benefits of the biosphere activities. A long-term good cooperation with several landowners has created a good level of confidence, which enables further nature conservation and sustainability activities.

Friends of Vattenrike and the biosphere ambassadors are involved in the activities, with tasks ranging from disseminating information in connection with various events to performing simple restoration measures in the landscape.

7.6 Update on management and coordination structure:

7.6.1 Describe any changes regarding administrative authorities that have competence for each zone of the biosphere reserve (core area(s), buffer zone(s) and transition area(s))? If there are any changes since the nomination form/last periodic review report, please submit the original endorsements for each area.

There have been no changes in the authorities responsible for the zones in the biosphere reserve since the application.

7.6.2 Update information about the manager(s)/coordinator(s) of the biosphere reserve including designation procedures.

The previous coordinator for the biosphere reserve retired in 2013, and Carina Wettemark, a former ecologist at the Biosphere Office, was appointed in the role. The post was advertised internally.

7.6.3 Are there any changes with regard to the coordination structure of the biosphere reserve? (if yes, describe in details its functioning, composition and the relative proportion of each group in this structure, its role and competence.). Is this coordination structure autonomous or is it under the authority of local or central government, or of the manager of the biosphere reserve?).

Kristianstad Municipality is the responsible authority for Kristianstads Vattenrike Biosphere Reserve, as was the case at the time of application. However, a reorganisation has taken place since 2005. The Biosphere Office and visitor centre has been part of the Civic Department under the Municipal Executive Office for Kristianstad Municipality since 2013.

7.6.4 How has the management/coordination been adapted to the local situation?

Kristianstads Vattenrike Biosphere Reserve covers the majority of the geographic area of Kristianstad Municipality. Kristianstad Municipality is the responsible authority for the biosphere reserve through the Biosphere Office under the Municipal Executive Office. It is a major advantage for Kristianstads Vattenrike Biosphere Reserve to operate within **a single** municipality, as issues relating to land use and social structure can be resolved in a municipal process in which the Biosphere Office participates.

The Biosphere Office's working model of adaptive co-management is well described in research studies as being a successful model for adaptive ecosystem management. This way of working allows the network to be built up with key individuals that represent the local community for each major project. In this way, the Biosphere Office creates arenas for information exchanges and discussion in a dynamic system based on local knowledge. The network can be tailor-made based on each project thanks to the Biosphere Office's contacts with stakeholders in various community sectors (non-profit, private and public) and at various decision making levels in society (municipal, County Administrative Board, national and international).

7.6.5 Was the effectiveness of the management/coordination evaluated? If yes, was it according to a procedure?

In 2014, a research group at the Stockholm Resilience Centre (Sweden) and Brock University (Canada) performed a 'resilience assessment' of the Kristianstads Vattenrike Biosphere Reserve through interviews, a questionnaire survey and two workshops. The researchers collated the existing knowledge and perceptions of the participants with regard to both the cooperation process (management/coordination) and its results.

This resilience assessment provided a considerable amount of positive feedback regarding the method of working and results in the biosphere reserve. Amongst other things, it emerged that the organisation of the biosphere reserve enables changes in the ecosystem to be detected and interpreted, and action to subsequently be taken where necessary. An important lesson that emerged was that there is a need for more resources and cooperation with stakeholders outside the biosphere reserve in order to address the major ecological challenges, such as the brownification of the River Helge å and the decline in the wading bird population.

Leading researcher highlights the biosphere reserve's work with dialogue and collaboration

Kristianstads Vattenrike Biosphere Reserve has attracted the attention of many international researchers because of its approach to sustainable development. The Stockholm Resilience Centre, a leading research institute in sustainable development, has analysed the Biosphere Office's approach in a number of doctoral theses. An approach known as 'adaptive comanagement' is applied in the biosphere reserve. This is a working method that is based on cooperation and draws lessons from the way in which measures impact on both nature and society. Knowledge is collated through inventories and dialogue with local stakeholders. Projects are then developed and appropriate measures implemented. The measures are then followed up to evaluate the effect of the initiatives and to allow the measures to be refined.

7.7 Update on the management/cooperation plan/policy:

7.7.1 Are there any changes with regard to the management/cooperation plan/policy and the stakeholders involved? If yes, provide detailed information on process for involvement of stakeholders, adoption and revision of the plan.

Two new editions of the action plan for the biosphere reserve have been published since 2005. A vote and discussions are held in the Consultation Group before any new action plan is determined. This means that the stakeholders affected have the opportunity to influence the content of the programme. The action plan previously had a strong focus on nature conservation, primarily in the wetland area, but this has now been broadened to take on a more overarching biosphere focus to include the biosphere's three functions of conservation, development and logistic support, in addition to covering the entire biosphere reserve.

7.7.2 Describe contents of the management/cooperation plan (provide some examples of measures and guidelines). Is the plan binding? Is it based on consensus?

The proposals for the action plan for Kristianstads Vattenrike Biosphere Reserve are developed by the Biosphere Office. The Consultation Group participates in the process and the plan is based on agreement. The action plan is a consultative plan containing guidelines for the overall work in the biosphere reserve with a focus on the three functions of conservation, development and logistic support.

A new action plan will be developed during 2015/2016. The most recent action plan for the years 2010-2013 was formulated according to the biosphere reserve's three functions and also included a special chapter for the work relating to the visitor centre. The extracts below from the action plan for 2010-2013 provide some examples subdivided according to the three functions:

Conservation

One of the functions of the biosphere reserve is to contribute to the conservation of landscapes, species and genetic diversity. This also safeguards important ecosystem services. Many people are involved in this work: landowners, local farmers and municipal authorities such as the The Technical Department of Kristianstad (C4 Teknik) and Environmental Health Department, the County Administrative Board, the Swedish Environmental Protection Agency, researchers and voluntary organisations. Conservation work focuses currently on the seasonally inundated grasslands, the sandy grasslands, the groundwater, rivers and lakes, but in the longer term this work will also encompass the other theme areas of the biosphere reserve. It is crucial that natural resources are utilised in ways that ensure long-term sustainability in the best interests of both people and the environment.

Conserve the wetlands bordering the River Helge å and the lakes

There have been many changes to the wetlands environment in the 25 years since conservation work first began in the biosphere reserve. Examples include increases in brownification, the decline of the reed beds and rushes, a dramatic increase in the greylag goose population and a reduction in the number of waders. To be able to carry out the appropriate measures, it is essential that work continues on making inventories of the region's fish, birds and plants. However, as the changes are not merely a local phenomenon but extend beyond regional and national boundaries, this requires collaboration in sharing knowledge both within Sweden and internationally.

Reduce eutrophication in the River Vinne å

There are many streams and rivers in the biosphere reserve and the water in these varies in quality. The highest levels of eutrophic nutrients in the lower drainage basin of the River Helge å have been detected in the River Vinne å. Agriculture is the dominant form of land use in the area through which the river flows. Land drainage has had a significant impact on the river and its tributaries, and large stretches of the main course have been straightened out. Landowners, voluntary organisations, consultants, the municipal Environmental Health Department and the Biosphere Office have initiated a joint project aimed at reducing nutrient enrichment. The goal is that the River Vinne å will achieve good ecological status in accordance with the EU's Water Framework Directive. An application will be made for government funding.

Adapt land use to conserve the sandy grasslands

The Biosphere Office is working to preserve the diversity and open countryside characteristic of the sandy grasslands in the biosphere reserve. Its partners in these endeavours include Kristianstad Golf Club in Åhus, farmers, researchers, Kristianstad's municipal Parks & Countryside Department, the Swedish Armed Forces, the County Administrative Board and the Swedish Environmental Protection Agency. Municipal planning must take the special needs of the sandy grasslands into consideration. Changes in land cover, new construction and a reduction in grazing all represent potential threats to the value of sandy grasslands. Therefore, it is important to try to protect fairly extensive areas by implementing a variety of measures aimed at adapting the way the land is used and managed and through various forms of protection.

Develop

Biosphere reserves are to contribute to developing an area in ways that will benefit people and the natural environment. One way in which this work is carried out is through close cooperation with local stakeholders. It is important to make good use of the knowledge and sense of commitment that exists in the local community and to stimulate interest in the area and create the right conditions for attracting regional and national development projects. To help achieve these ambitions there are resources with experience of sustainable development both in local and regional government authorities and at Kristianstad University and other educational institutions in Sweden.

Ecotourism to grow in the long-term

It is important to establish Kristianstads Vattenrike Biosphere Reserve as an ecotourism destination. This will require collaboration between many stakeholders, including: Tourism in Skåne, Destination Kristianstad, the Swedish Ecotourism Society, entrepreneurs working with nature-related forms of tourism, and local nature guides. The Naturum Vattenrike visitor centre has a key role to play in this connection.

Sustainable development projects

Projects both large and small are under way in a number of theme areas aimed at developing and utilising the values of the ecosystems in a sustainable way.

Coastal regions of Hanöbukten bay: An Eel Conservation Group has been set up to save the region's eels and safeguard the future of the eel-fishing industry. The project is a joint venture among local and regional stakeholders, supported by national expertise.

Sandy grasslands: Work to balance the need for leisure and recreational facilities with the need to protect biological diversity continues, both on and around the multifunctional golf

course in Åhus and at Åsumsfältet, where the ultimate aim is to establish a multifunctional nature reserve.

Wetlands along the River Helge å: The creation of the Årummet nature reserve in the heart of Kristianstad will benefit residents, visitors and the natural environment.

Several projects under the Biosphere Office's activities extend over more than one geographical or thematic area. One example is the restoration project in the River Vinne å drainage basin.

Support

'Biosphere reserves exist in part to make it easier for the general public, students and researchers to explore everything of value that an area has to offer. With this in mind, Kristianstads Vattenrike maintains visitor sites, runs a Nature School and liaises closely with Kristianstad University and other universities. There are around 20 visitor sites in the biosphere reserve with outdoor museums, information displays, raised boardwalks and birdwatching towers. Several of the sites are also accessible for wheelchair users. The Naturum Vattenriket visitor centre will be the focal point for everyone working in and visiting Kristianstads Vattenrike Biosphere Reserve. Spreading information is another important element of support activities. There are various channels for this, from a regularly updated website and information folders to clear signposting and marked trails out in the countryside.'

A wide variety of information channels

The ambition is to make all material as accessible and easy to understand as possible for visitors. The amount of online information available on the Biosphere Office's website is constantly increasing and this now constitutes an important channel of communication. 'Vattenriket in Focus' is a series of publications that includes reports, surveys and information leaflets. All publications are distributed to a selection of public authorities, libraries, educational institutions, civil servants and politicians, and are also available on Kristianstads Vattenrike's website. Publicity via the press, radio and TV is an important way of spreading information and marketing the biosphere reserve in general and key issues in particular. The reserve's visitor sites and activities are also marketed at trade fairs, in folders and on the web.

More research linked to Kristianstads Vattenrike Biosphere Reserve

Kristianstad University fulfils an important role as a coordinator for research in the biosphere reserve. In addition to its own research resources, the university also offers courses in biology and landscape planning. It is important that new graduates have a good insight into the work being carried out in the biosphere reserve. Projects and degree theses that focus on the area are important sources of new knowledge. Other educational institutions also perform research in the biosphere reserve, such as the Stockholm Resilience Centre for example, and the staff of the Biosphere Office have an important task in supporting such persons in this work.

Other support and information work

The Biosphere Office has other important tasks in relation to its support function. For example, this includes organising biosphere camps for schoolchildren during the summer holidays, improvements to the exhibitions at outdoor visitor sites, such as the Canal House Outdoor Museum, and new versions of information materials.

Naturum Vattenriket visitor centre

The Naturum Vattenriket visitor centre – 'in the heart of Kristianstad, in the heart of the wetlands' – is not only a gateway to Kristianstads Vattenrike, but also the natural focal point for everyone engaged in projects in the biosphere reserve. The unique location of the building ensures visitors of a truly out-of-the-ordinary experience. But Naturum Vattenriket also has a great deal more to offer: a wide variety of activities and events related to the current season or the key themes of the biosphere reserve, lots to discover and experience in the fascinating exhibitions, a Nature School for children and teachers, an auditorium that offers panoramic views of the area and can be booked for meetings and conferences, and a restaurant that overlooks the urban wetlands and the city of Kristianstad beyond.

Varied programme and guided tours

The Naturum visitor centre is staffed by competent and well-informed personnel. There is a standard price-list for booking lectures for groups or guided tours with Naturum staff. A varied programme of more than 100 events a year reflects seasonal changes in the biosphere reserve and focuses on other appropriate themes. Local associations and other partners are invited to collaborate in the programme of events through their participation in a special Reference Group.

For major events in Kristianstad, the Naturum visitor centre can act as a resource by offering a wide range of activities.

Naturum Vattenriket works together with the Swedish Centre for Nature Interpretation to ensure that the information and guiding activities are of high quality.

Focus on outdoor education

Another focus area for Naturum Vattenriket is outdoor education for schoolchildren, students and teaching staff, primarily from the municipality of Kristianstad. These activities, which are possible thanks to collaboration with Kristianstad University, take the form of education in nature interpretation for visiting classes, continuing professional development for teachers, work placements for students from Kristianstad University, research seminars and the Biosphere Summer Camp.

Marketing to attract visitors

When the Naturum visitor centre has opened in 2010, marketing will be intensified in order to attract more visitors to the centre itself, to the various outdoor visitor sites in Kristianstads Vattenrike, and to nature-related tourist activities and other facilities in Kristianstads Vattenrike from spring 2011 onwards. Close contacts will be established with journalists and the media, especially in Denmark, in order to facilitate the work of marketing the biosphere reserve through articles, etc. Other key elements of the marketing strategy include an informative website that is kept constantly up-to-date and materials in the form of folders, etc.

7.7.3 Describe the role of the authorities in charge of the implementation of the plan. Describe institutional changes since the nomination form/last periodic review report. Please provide evidence of the role of these authorities.

The proposals for the action plan for Kristianstads Vattenrike Biosphere Reserve are developed by the Biosphere Office. The Consultation Group participates in the process and the plan is based on agreement. Several authorities are represented in the consultation group, which has been well anchored. There is a close dialogue and cooperation with the authorities affected such as the County Administrative Board and Swedish Forest Agency, which significantly aids the implementation of several of the action plan's goals in cases where this is appropriate for the implementation of various sub-projects in the action plan.

There is also a close cooperation between the conservation manager in Kristianstad Municipality (the position of which is financed by both the County Administrative Board and Kristianstad Municipality) and the Biosphere Office, which provides good support for the implementation of the action plan. No institutional changes have taken place since nomination.

7.7.4 Indicate how the management plan addresses the objectives of the biosphere reserve.

As described under question 7.7.2, the action plan is based on the three functions that a biosphere reserve must fulfil in accordance with the Statutory Framework and the Seville Strategy as subsequently updated through the Madrid Action Plan. There are clear guidelines and goals as to how the work must achieve the goal for a biosphere reserve, how the biosphere reserve will work to *conserve* valuable natural values, contribute towards sustainable *development* in the area and to *support* research, training and the dissemination of information regarding the value of Kristianstads Vattenrike Biosphere Reserve in particular and biosphere reserves in general (see question 7.7.2 for details).

7.7.5 What are the progresses with regard to the guidelines of the management/cooperation plan/policy?

Virtually all goals and guidelines established in the most recent action plan (see question 7.7.2) have been completed and achieved (see the summary below).

Wetlands bordering the River Helge å and the lakes

Intensive work related to initiatives to raise levels of knowledge have both taken place and are ongoing in the framework of this area. Examples of this are survey fishing in Lakes Hammarsjön and Araslövssjön, inventories of wading birds on the wet grasslands, and mussel and greylag geese inventories. National, and in some cases international, contacts have been made in the form of meetings and conferences in order to raise knowledge levels. Work in connection with the creation of wetlands has commenced upstream in the biosphere reserve in order to reduce brownification in connection with the humus rich Bivarödsån watercourse, which flows through forested areas.

Reduce eutrophication in the River Vinne å

Work in on the creation of wetlands in connection with the River Vinne to reduce nutritive salt loads entering the River Helge å and Hanöbukten bay have been very successful. The goal of creating 50 ha of wetlands has been exceeded by a wide margin with the creation of more than 80 ha, which was made possible amongst other things thanks to good contacts with landowners and entrepreneurs and cost efficiencies. The work has also been very positive for biodiversity in the area and has also been beneficial for users, as part of the wetlands can be used for water extraction during the growing season.

Adapt land use to conserve the sandy grasslands

There has been a positive development in terms of the sandy grasslands in recent years in several parts of the biosphere reserve. The work of the Biosphere Office in restoring sandy grasslands in cooperation with landowners has been very successful, as has been illustrated in the follow-up inventories. Two municipal nature reserves (Sännarna and Horna sands) and one government nature reserve (Horna gravel pit) have been established on valuable sandy grasslands west of Åhus in an area where there has been a large amount of development pressure. The three reserves have a total area of around 110 ha. Two nature conservation

agreements have been concluded on privately owned land on Ripa sands. The work has taken place in cooperation with the County Administrative Board and covers a total of 113 ha.

A positive dialogue with the Swedish Fortifications Agency and the Swedish Armed Forces has been developed, which has resulted in positive views regarding the development in natural and recreational attitudes regarding the highly valuable Åsum Field.

Ecotourism to grow in the long-term

Kristianstads Vattenrike attracts many visitors to north-eastern Skåne. A considerable amount has already been done in terms of accessibility, information and marketing the area, and the Biosphere Office is attempting to support ecotourism in the biosphere reserve in various ways. The construction of Naturum Vattenriket has provided a visitor centre, and knowledgeable nature guides show visitors out into the biosphere reserve. A pilot study has been developed to create a green tourism destination in north-eastern Skåne in the long-term and to develop a network between the various entrepreneurs.

Sustainable development projects

The internationally environmentally certified multifunctional golf course in Åhus has been highlighted in several national and Nordic contexts as a good example of sustainable development. The Biosphere Office has created the requisite conditions together with Kristianstad Golf Club for both conserving and developing natural, cultural and recreational values through a close cooperation. The fact that a golf course that is attractive to play on can create added value from many perspectives is a good example of sustainable development benefiting man and nature. For example, the 'Sännastigen' hiking trail has been created on the golf course land. The path makes it possible to walk from the urban area of Åhus to the Sännarna Outdoor Museum in a safe manner in terms of road safety, and simultaneously provides a good natural experience. By reading the information signs, it is possible to learn more about the area's natural and cultural values.

Another good example is the wetland area bordering the River Helge å in the centre of Kristianstad in the middle of Kristianstads Vattenrike where the Årummet nature reserve has been created for the benefit of the environment and people.

A wide variety of information channels

The amount of online information available on the Biosphere Office's website is constantly increasing and this now constitutes an important channel of communication. The website has in excess of 300,000 visits annually and the number of followers on Facebook is over 1,700. Around 60 publications have been published in the Biosphere Office's 'Vattenriket in Focus' series of publications. The Biosphere Office has also produced a large number of information leaflets and folders during the first ten years of the biosphere reserve. Publicity via the press, radio and TV are important ways of disseminating information and marketing the biosphere reserve, and we publish around 50 news articles on the blog annually.

More research linked to Kristianstads Vattenrike Biosphere Reserve

A large number of research projects are currently taking place in the biosphere reserve, and several of these are related to ecosystem services. This research is being undertaken by Kristianstad University and the Stockholm Resilience Centre amongst other places.

Other support and information work

The Biosphere Office has other important tasks in relation to its support function. An annual research conference has been arranged together with Kristianstad University since 2011, in

which current research in the biosphere reserve is discussed and the general public, civil servants, landowners and associations are invited to participate. Another example is that we have held biosphere camps for children and young people during the school holidays over a period of four years, in which participants can learn more about the biosphere reserve at the same time as having good natural experiences here. Several visitor sites in the landscape such as the Åsum grasslands, and Pulken and Canal House Outdoor Museums have been given new and updated exhibitions during recent years.

Naturum Vattenriket visitor centre

Varied programme and guided tours

The Naturum Vattenriket visitor centre had its 500,000th visitor in the autumn since it was opened in 2010 and was Sweden's most frequently visited Naturum visitor centre in 2014. The programme is varied and includes over 400 events a year. Many visitors return and this serves as a good testimonial to the knowledgeable staff who also work constantly on the development of exhibitions and activities.

Focus on outdoor education

The nature educators at Naturum Vattenriket visitor centre receive visits from three school classes every week to learn more about the biosphere reserve and its value. There is also regular cooperation with Kristianstad University in relation to its teacher training and in-service training for teachers.

Marketing to attract visitors

There have been over 500,000 visitors to the visitor centre over a period of four years, which may be considered as confirmation that the marketing has been successful, and more than 150,000 people make their way to the visitor sites in the biosphere reserve every year.

7.7.6 Were there any factors and/or changes that impeded or helped with the implementation of the management/coordination plan/policy? (Reluctance of local people, conflicts between different levels of decision-making).

The staff at the Biosphere Office have been working with a dialogue and in cooperation with local stakeholders in the area since 1989. The work has been developed on the basis of good examples and interested stakeholders, which has subsequently developed into larger projects/measures. An important element is the creation and development of trust between the staff of the Biosphere Office and the various stakeholders located in the landscape. This working method is sometimes described as 'adaptive co-management', and facilitates the implementation of the action plan.

The close cooperation that has been developed and exists between various authorities, e.g. the County Administrative Board and the Swedish Forestry Agency, has also facilitated the implementation of the action plan.

7.7.7 If applicable, how is the biosphere integrated in regional/national strategies? Vice versa, how are the local/municipal plans integrated in the planning of the biosphere reserve?

(Please provide detailed information if there are any changes since the nomination form/last periodic review report).

Since nomination in 2005, a closer cooperation has been developed between various administrations in Kristianstad Municipality and the Biosphere Office. For example, a representative from the Biosphere Office participates in the periodic planning consultation held by the Kristianstad City Planning Administration. In this way, knowledge relating to natural values and recreational interest can be conveyed at an early stage in the process and with a better end result as a consequence. The Biosphere Office has a well-developed network, which means that the biosphere activities are also highlighted in regional and national strategies.

In the municipal comprehensive plan, as most recently revised in 2013, the biosphere reserve is primarily touched upon in respect of aspects concerning conservation and support activities in the planning work.

The nature conservation programme for Kristianstad Municipality was updated in 2014 with a supplementary strategy regarding the way in which the conservation work is to be carried out over the next five years. An updated environmental objective programme with local environmental objectives has also been developed in 2014. This contains a strategy element specifying the objectives and division of responsibility for various types of nature and environment-related issues. The Biosphere Office has an explicit responsibility for achieving a number of different objectives in both programmes.

In 2014, the County Administrative Board of Skåne published an analysis of where high natural values associated with red-listed species are concentrated in the county of Skåne. Kristianstad Municipality and Kristianstads Vattenrike Biosphere Reserve clearly emerged as one of the most species rich areas in the county. The County Administrative Board has also produced a conservation strategy on the basis of the analysis, which is linked to relevant national environmental targets and was distributed for consultation in 2014. The strategy specifies the challenges, goals and methods of the conservation work and mentions Kristianstads Vattenrike Biosphere Reserve as being an important stakeholder for conservation work in the species rich area of north-eastern Skåne.

As part of the Swedish conservation policy at a national level, the biosphere reserve has become a tool in a similar way to that of nature reserves and national parks, with the aim of achieving sustainable development. The Swedish Environmental Protection Agency highlights the biosphere reserves as pilot areas in which new methods and new knowledge can be tested with regard to sustainably managing the relationship between man and nature. As Kristianstads Vattenrike was the first biosphere reserve in Sweden, the success of the reserve has been important for the continuing establishment of biosphere reserves in Swedish nature conservation.

8. CRITERIA AND PROGRESS MADE:

[Conclude by highlighting the major changes, achievements, and progress made in your biosphere reserve since nomination or the last periodic review. How does your biosphere reserve fulfill the criteria. Develop justification for the site to be a biosphere reserve and rationale for the zonation. What is lacking, and how could it be improved? What can your biosphere reserve share with others on how to implement sustainable development into practice?]

Brief justification of the way in which the biosphere reserve fulfills each criteria of article 4 of the Statutory Framework of the World Network of Biosphere Reserves:

1. "Encompass a mosaic of ecological systems representative of major biogeographic region(s), including a gradation of human interventions". (The term "major biogeographic region" is not strictly defined but it would be useful to refer to the Udvardy classification system (http://www.unep-wcmc.org/udvardys-biogeographical-provinces-1975_745.html)).

According to Udvardy's classification system, the Biosphere Reserve belongs to a type of landscape known as "Central European forest", which is characterised by broadleaf forests or woodlands. Based on the EU's classification system, the area belongs to the Continental region.



Geotechnical regions in Europe in accordance with the EU's classification. Kristianstads Vattenrike Biosphere Reserve belongs to the Continental region which is the most northerly outpost of a Central European landscape type.

Kristianstads Vattenrike Biosphere Reserve is situated in Skåne, the most southerly of Sweden's provinces, which constitutes the most northerly outpost of this landscape type, while the rest of Sweden belongs to the boreal or alpine region according to the EU's classification.

The biosphere reserve represents a combination of ecosystems that exhibit the characteristics of Central Europe that is unique in Sweden. Due to the relatively low population density and the relatively low degree of exploitation, many ecosystem services and biological values are still in existence.

The area is situated in a cultural landscape containing a large number of habitat and land cover types on the Kristianstadsslätten Plain and surrounding Archean rock areas. All of these play a vital role in the functioning of the ecosystems and ecosystem services.

Within the biosphere reserve, a number of theme landscapes with high natural values have been identified. These form the basis for the work of the biosphere reserve relating to the three functions. The theme landscapes are as follows:

- The rich wetlands along the River Helge å
- Tributaries of the River Helge å originating on Linderödsåsen Ridge
- Rich woods and forests on the slopes of Linderödsåsen Ridge
- The coastal landscape with extensive sand dunes formerly managed under a rotational system of cultivation and fallow
- The coastal waters of Hanöbukten Bay
- Sandy grasslands
- Balsberget Hill and Lake Råbelövssjön
- Ancient trees and wooded habitats in cultivated areas
- Urban natural values
- Groundwater

2. Be of Significance for biological diversity conservation”.

Within Kristianstads Vattenrike Biosphere Reserve, there is unusually high biodiversity from a national perspective, with a high concentration of red-listed species and valuable natural environments. According to the national red list, a total of 775 species are known within the biosphere reserve, of which 366 are threatened (see also supporting document 9 (4)). The principal basic preconditions for the rich biodiversity in the area are the wide topographic variation, the location adjacent to the Baltic Sea, calcareous soils, a cultivated landscape with a long history, a comprehensive and varied freshwater system and a dry and mild climate. A description is presented below of the three theme areas within the biosphere reserve, which encompass natural environments with particularly high biodiversity and which are therefore particularly important in the conservation work, particularly as regards the internationally important task of halting the extinction of threatened species.

The rich wetlands along the River Helge å

The central area of the biosphere reserve consists of the River Helge å Ramsar and Natura 2000 site, with its lowland lakes, seasonally inundated grasslands and wet forests. The area covers over 8,000 hectares, of which over 40% is protected within 14 separate nature reserves. A broad range of high biodiversity is linked to the various water-related habitats in flowing water, in the lakes and in the wetlands. In the rivers and lakes, there is a rich fauna of freshwater fish and large mussels, while on the wet grasslands, a rich birdlife breeds and rests,

and there is also a diverse land mollusc fauna. Examples of nationally and internationally red-listed species in the areas are Common Kingfisher (*Alcedo atthis*), Thick-shelled River Mussel (*Unio Crassus*), Black-tailed Godwit (*Limosa limosa*), Otter (*Lutra lutra*) and European Catfish (*Silurus glanis*).

The rich woods and forests on the slopes of Linderödsåsen Ridge

Beech-dominated broadleaf forests with particularly high natural values can be found along the steep northern slopes of the river. Areas with especially high natural values are primarily concentrated in the ravines that have been cut by streams. Calcareous soils and shallow groundwater give rise to a rich soil flora. There are also important occurrences of lichens, mosses and fungi. Terrestrial fungi dominate amongst the critically endangered and endangered species in the broadleaf forests and many of these are linked to ancient broadleaf forests on calcareous soil. Over half of Sweden's threatened invertebrates depend on wooded environments, especially habitats that include broadleaf trees, old hollow trunks and decaying wood. In broadleaf forests such as that at Maltesholm, over 60 species of mollusc and over 1200 species of beetle have been encountered, many of which are red-listed. This is one of the country's richest locations for these groups of species. Along the north-eastern slope of the Linderödsåsen Ridge, there are currently eight nature reserves and four Natura 2000 sites. The Swedish Forest Agency has also delimited over a hundred different key biotypes in the area.

Sandy grasslands

The sandy grasslands of the Kristianstadsslätten Plain were once managed under a rotational system of cultivation and fallow. Today, the most valuable areas consist of permanent grazing land which is not fertilised. These open sandy grasslands have a history dating back many thousands of years and are home to a flora and fauna which are specially adapted to the dry, warm and calcareous conditions. In the highly calcareous areas are **Xeric** sand calcareous grasslands which represent a unique and threatened habitat, both regionally and globally. **Xeric** sand calcareous grasslands primarily occur in eastern Skåne, where around 70 localities are known covering a total area of approx. 20-30 hectares. The majority are situated in the biosphere reserve. The most unique values in the biosphere reserve with regard to the occurrence of critically endangered and endangered species are found in the open sandy grasslands. Half of the 142 critically endangered and endangered (CR+EN) species within the biosphere reserve occur here. The species groups vascular plants, butterflies and hymenoptera are best represented. The biosphere reserve is also one of the five most prominent areas in the country for threatened species dependent on open sandy grasslands. Examples of nationally and globally threatened species in the sandy grasslands are the Tawn Pipit (*Anthus campestris*), Large Blue butterfly (*Maculinea arion*), Scarab Beetle (*Heptaulacus sus*), Mason Bee (*Osmia maritima*) and Sand Pink (*Dianthus arenarius*). Sandy grasslands are present in five Natura 2000 sites and three nature reserves.

3. “Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale”.

(Including examples or learning experiences from putting sustainable development into practice).

The biosphere reserve is working on sustainable development throughout the biosphere reserve itself in a variety of ways. Our work/measures are well-suited to demonstrating methods for sustainable development at local, regional and international levels. We welcome visitors and interested groups who want to learn about our work relating to sustainable development. The biosphere reserve's staff are frequently hired to give lectures at seminars and conferences, many of which are held in the biosphere reserve. Practical examples from

Kristianstads Vattenrike Biosphere Reserve are:

- **Multifunctional golf course:** the collaboration between the biosphere reserve, Kristianstad Municipality and Kristianstad Golf Club has resulted in a golf course which conserves and develops high natural values and promotes outdoor recreation, whilst at the same time being a high-quality and attractive facility for the sport of golf. This approach to integrating the sport of golf and natural and recreational values may be of value in an international context. The approach has spread to other Scandinavian countries through STERF (Scandinavian Turfgrass and Environment Research Foundation, see 1 L).
- **Establishment of wetlands:** creating wetlands in the landscape helps to contain diffuse nutrient, reducing eutrophication in the River Helge å and Hanöbukten Bay and promoting biodiversity. The wetlands also contribute to an attractive environment for recreation and are often home to a rich birdlife. Many wetlands are also used for irrigation purposes.
- **Wet grassland management:** A good, long-term collaboration and trust has been built up between landowners and the biosphere reserve and enabled the restoration and establishment of additional nature reserves on the wet grasslands. Management resources for the nature reserves and from the EU's agricultural funding are helping to secure the long-term existence of farmers who invest time and money in managing the grasslands. In this way, the work of the biosphere reserve has helped to enable farmers to continue mowing and grazing, and also provided more opportunities to conserve and develop the values of wet grasslands. Some landowners have got together and established the 'Beef from Wet Grasslands' (*Strandängskött*) brand, which is meat that has been produced on the wet grasslands and sold in a local grocery store as environmentally friendly meat.
- **The crane project:** In the past, cranes have caused considerable damage to spring crops. However, a crane group has been set up through a dialogue and collaborative effort between the farmers, the County Administrative Board, the Bird Society of North-East Scania (*Nordöstra Skånes fågelklubb*) and the biosphere reserve. Together, the group found a way of feeding the cranes in the field adjacent to the Pulken visitor site. In this way, damage to farmers' fields was minimised, the cranes could feed undisturbed and spectators could watch the cranes' dancing. The arrival of the cranes is a major tourist attraction which attracts over 8,000 visitors every year both from across Sweden and from abroad.
- **Ecotourism and outdoor recreation:** Kristianstads Vattenrike Biosphere Reserve offers opportunities for ecotourism and outdoor recreation through the provision of man-made paths, duckboards, signs and many visitor sites. Many are also accessible to the disabled. By offering excellent natural experiences, the biosphere is contributing to the tourist industry, which in turn benefits both local entrepreneurs and the municipality. Greater awareness and interest in the high natural values of the biosphere are also contributing to a better understanding of the conservation work.

A key to the work relating to sustainable development in the biosphere reserve has been the change in attitude which has been brought about amongst the general public and stakeholders through the success of the biosphere reserve's work. The natural values in the biosphere

reserve are now seen as an asset and an important part of the brand for Kristianstad Municipality. One of the most tangible signs of the successful work to change attitudes is the construction of visitor centres. The wetlands around the City of Kristianstad were for some time considered to be waterlogged and uninteresting, and the area was used as the city's landfill site during the 1950s. Sixty years later, Kristianstad Municipality built and opened the Vattenriket visitor centre in the same location and the wetlands were presented as a resource and an asset for the city. The number of people visiting the visitor centre has exceeded all expectations. Four years after it opened, over 500,000 people visited the visitor centre, and in 2014, Vattenriket visitor centre was Sweden's most frequently visited visitor centre.

4. “Have an appropriate size to serve the three functions of biosphere reserves”.

The biosphere reserve covers a total area of 104,375 ha (approx. 1,044 km²) and encompasses the lower catchment area of the River Helge å in Kristianstad municipality and the coastal areas of Hanöbukten Bay, which is part of the Baltic Sea.

Over the past ten years, many projects have been successfully carried out within the boundaries of the biosphere reserve, which clearly indicates that the area provides good opportunities to fulfil the functions of conservation, development and logistic support.

5. Appropriate zonation to serve the three functions

In accordance with UNESCO's criteria, the biosphere reserve is divided into three zones – a core area, a buffer zone and a transition area. The Swedish Environmental Code forms the basis for the zonation.

No changes have been made to the zonation since 2005.

The core areas, which cover a total area of 7,179 ha, consist of nature reserves, habitat protection areas and Natura 2000 sites, all of which are protected by Swedish law. The conservation objectives in the core areas are mainly linked to lakes and the seasonally inundated grasslands, wet forests and shoreline forests contiguous to these lakes. In addition to these types of landscape and ecosystem, the core areas include flowing water, dry grasslands with elements of xeric sand calcareous grasslands, outfield pastures, sand dunes and forested areas.

The buffer zones amount to 22,900 ha and comprise areas designated as a Ramsar site, areas of national interest for the purpose of nature conservation and shore protection areas. Parts of these areas which consist of nature reserves or Natura 2000 sites are situated in the core areas, whereas the surrounding land forms part of the buffer zones. Other areas classified as buffer zones are areas which are listed in the municipally owned nature conservation areas and state-owned nature conservation areas which have not been awarded formal protection.

The buffer zones largely consist of private land.

The transition area covers an area of 74,297 ha. Less than 10% of this area is owned by the municipal authority or the state. It largely consists of agricultural land, forested and urban areas and sparsely populated areas.

6. “Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and the carrying out of the functions of a biosphere reserve”.

The Biosphere Office coordinates many activities aimed at conserving, developing and supporting the landscape's values in accordance with UNESCO's Man and the Biosphere Programme. During the past ten years, the Office has been expanded from three to thirteen full-time employees. The organisation has been integrated into the municipal authority's structure and established a closer collaboration with other municipal administrations.

Before Vattenriket was nominated as a biosphere reserve, the work was primarily aimed at information and environmental management with a focus on the wetlands. The establishment and expansion of the Biosphere Office has enabled the work to be broadened. Today, projects are being carried out within all the biosphere reserve's theme areas. This has helped to increase the number of collaborative partners coming into contact with authorities, landowners, organisations, etc.

The work has been designed to involve and engage stakeholders in the work to achieve the objectives of the biosphere reserve. The consultation group for Kristianstad Vattenrike Biosphere Reserve had already been established by the time the area became a biosphere reserve. The group has a consultative role and acts as an arena for dialogue and the exchange of information and knowledge between representatives of stakeholders within the biosphere reserve and politicians and officials in the municipality, local organisations and regional authorities. The consultation group meets three times a year. One of these meetings is held in the field in order to study and discuss a topical issue on-site.

7. Mechanisms for implementation:

a) Mechanisms to manage human use and activities

Some activities are regulated through existing national, statutory regulations or through the municipal policy concerning municipally owned nature conservation areas. The EU's environmental funding is also available relating to the use of valuable grazing and mowing land.

Thoughts and ideas from associations, landowners, farmers, users and the general public can be presented via the Consultation group or through direct contact with Biosphere Office staff. Conversely, the Biosphere Office staff disseminate information concerning topical projects, etc. through the Consultation Group's meetings or through direct contact with stakeholders. Various associations are also invited to participate in programme boards for visitor centre programmes, through which ideas and wishes can be put forward. Every year, many people visit the Vattenriket visitor centre, making it a natural meeting place where thoughts and ideas concerning the biosphere reserve can be put forward and discussed with the staff.

b) Management policy or plan

Proposals for management policies for Kristianstads Vattenrike Biosphere Reserve are drawn up by the Biosphere Office. The Consultation Group participates in the process and the plan is based on agreement. The management policy is a consultative plan with guidelines for the overarching work within the biosphere reserve, and places an emphasis on the three functions:

conserve – develop – support. The management policy is implemented by the Biosphere Office with the support of local, regional, national and, in some cases, international bodies and authorities.

c) Authority or mechanism to implement this policy or plan

The Biosphere Office has no authority function, as no new laws or ordinances have been drawn up for a biosphere reserve. The Office's remit is to coordinate its own work within the biosphere reserve, and to support, initiate and follow up activities which other actors carry out if they fall within the framework of the management policy for Kristianstads Vattenrike Biosphere Reserve. The Biosphere Office also provides assistance as regards the preparation of background information and proposals for decisions by Kristianstad Municipality, Skåne County Administrative Board and other local, regional and national bodies.

d) Programmes for research, monitoring, education and training

Research, environmental monitoring, education and training are carried out both under the direction of the Biosphere Office and through a dialogue and collaboration with educational centres, authorities and associations.

Research at the biosphere reserve is being conducted within various fields by universities and government institutions. The biosphere reserve has attracted researchers from around the world and has been cited in a number of international scientific periodicals.

The Biosphere Office collaborates with many universities. Stockholm Resilience Centre has conducted a number of multidisciplinary studies during the ten-year history of Kristianstad Vattenrike Biosphere Reserve.

When Kristianstads Vattenrike became a biosphere reserve, Kristianstad University set up the Man & Biosphere Health (MABH) research community. MABH studies the relationship between man and ecosystems and their reciprocal impacts. MABH is involved in action programmes and the development of new techniques for combating the adverse effects of human activity. The research community forms a natural link to UNESCO's biosphere reserve concept, according to which people are an integral part of ecosystems.

Environmental monitoring is an important aspect of the biosphere's activities. Prior to new projects, investments are made to collate information concerning natural values. These investments are then regularly followed up in order to analyse the effect of the measures that are implemented, so that they can be adjusted as and when necessary.

An annual count of resting geese and cranes is performed during the winter months by the Bird Society of North-East Scania (*Nordöstra Skånes Fågelklubb*). The results of these counts are of considerable benefit in the work relating to geese and crane management on the Kristianstadsslätten Plain which is aimed at reducing the damage caused to crops.

The work in connection with monitoring and survey fishing for European catfish is carried out under the direction of the Biosphere Office in collaboration with the Swedish Agency for Marine and Water Management and the County Administrative Board of Skåne, which have also part-financed the project.

Education: Kristianstad University is the biosphere reserve's key node for higher education. The university offers programmes and courses with a direct focus on the environment and sustainability at undergraduate, graduate and research levels.

Stockholm Resilience Centre (part of Stockholm University), the Swedish University of Agricultural Sciences (SLU) and Lund University use Kristianstads Vattenrike Biosphere Reserve in connection with advanced level courses in order to illustrate adaptive joint management and sustainable development.

The Biosphere Office and Vattenriket visitor centre offer training and the possibility for university and upper secondary school students to write a thesis. In addition, teaching is provided for pupils and teachers relating to the natural environment, along with biosphere camps for children during the school holidays, field tours, training of biosphere ambassadors and conferences.

8. Does the biosphere reserve have cooperative activities with other biosphere reserves (exchanges of information and staff, joint programmes, etc.)?

At the national level

The Swedish biosphere reserves have a well-developed cooperation both amongst themselves and with the Swedish MAB. Representatives of the Swedish biosphere reserves meet at least once a year for workshops and conferences, at which experiences and information concerning biosphere activities are exchanged. Direct study visits often take place between the Biosphere Reserve and other Swedish biosphere reserves. In autumn 2014, the entire Biosphere Office went on a study visit to Blekinge Archipelago Biosphere Reserve. We met the coordinator and other actors in the biosphere reserve. Such visits enable the valuable exchange of knowledge and provide inspiration.

The Biosphere Office's activities have been vital in the establishment of other biosphere reserves in Sweden. Kristianstads Vattenrike was the first biosphere reserve in accordance with the Seville Strategy and has therefore acted as a model area for the other biosphere reserves. The Biosphere Office has contributed information and advice regarding both the application process and potential activities in various biosphere reserves.

At regional level

There are no other biosphere reserves in Skåne. The nearest biosphere reserve is the Blekinge Archipelago, and information and knowledge are exchanged between the biosphere reserves (see the section above).

Through twinning and/or transboundary biosphere reserves

Kristianstad Vattenrike Biosphere Reserve is not a twinned or transnational biosphere reserve, but is situated within Sweden's borders.

Within the World Network

The Biosphere Office has a partnership with Schaalsee Biosphere Reserve in Germany. Staff from Kristianstads Vattenrike have made visits to Germany and representatives from Schaalsee have visited Kristianstads Vattenrike Biosphere Reserve. The Biosphere Office

staff have also given advice to potential biosphere reserves in both Norway and the UK concerning the nomination process and the benefits of being a biosphere reserve.

Biosphere Office staff have also participated in many EuroMAB conferences and given lectures on a number of occasions. Meeting representatives of other biosphere reserves and exchanging experience and knowledge is both very rewarding and beneficial.

Obstacles encountered, measures to be taken and, if appropriate, assistance expected from the Secretariat

Kristianstads Vattenrike Biosphere Reserve has received strong support from the Secretariat. The visit by the EuroMab coordinator to Kristianstads Vattenrike during the summer of 2014 was both valuable and greatly appreciated.

9. Main objectives of the Biosphere Reserve:

Describe the main objectives of the biosphere reserve integrating the three functions and the sustainable development objectives for the coming years.

The main objective of the Biosphere Office's work is to ensure that Kristianstads Vattenrike Biosphere Reserve continues to meet UNESCO's criteria and intentions for biosphere reserves, and that Kristianstads Vattenrike continues to fulfil the requirements and intentions of the Swedish Environmental Protection Agency regarding visitor centres in Sweden. All work is carried out on the basis of the three functions: conserve, develop and support. Other primary and secondary objectives are presented below:

Main objectives for Kristianstads Vattenrike Biosphere Reserve:

- To continue to promote sustainable development which is beneficial for both man and nature in Kristianstads Vattenrike Biosphere Reserve and to disseminate our knowledge and experiences at local, regional, national and international levels
- To ensure that Kristianstads Vattenrike and the visitor centre continue to be an important part of Kristianstad Municipality's prioritised tasks and, in this way, contribute to the attractiveness and development of Kristianstad
- To promote biological diversity in the various landscape themes of the biosphere reserve
- To enable the general public, pupils and researchers to learn about everything that is valuable in the biosphere reserve, through the provision of good logistical support (website, visitor sites, visitor centres, information material, information in the landscape, social media, wide areas of duckboarding, road signs, etc.) and to improve access in the biosphere reserve
- To continue to develop a close dialogue and collaboration with the general public, landowners, users, residents, visitors, entrepreneurs, associations, consultation groups, universities, university colleges, organisations, officials, authorities, politicians, other institutions, etc. in order to promote sustainable development in Kristianstads Vattenrike Biosphere Reserve and to safeguard traditional and cultural knowledge.

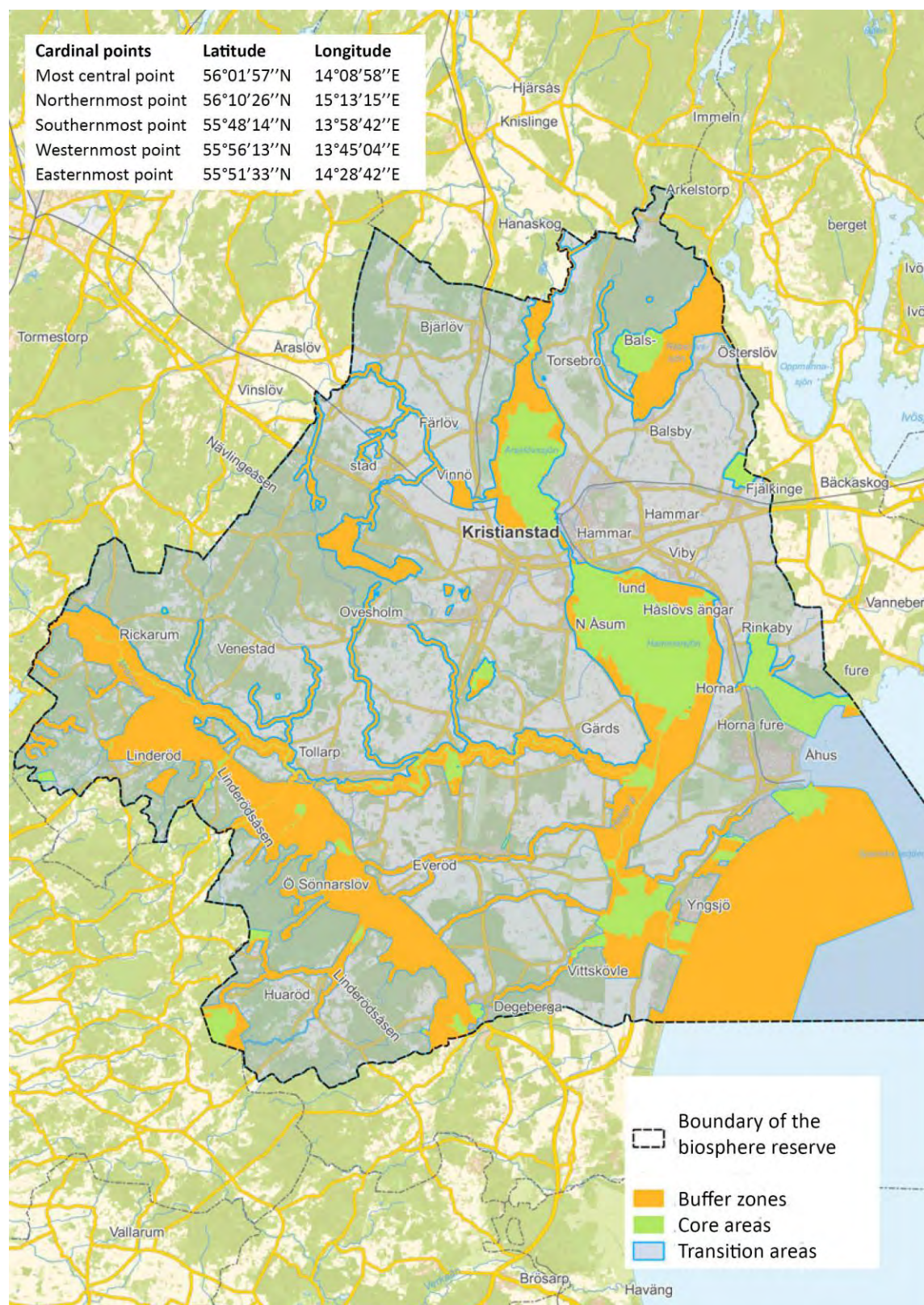
Specific secondary objectives for Kristianstads Vattenrike Biosphere Reserve:

- To continue and further develop the work to map, communicate and raise the profile of the 'ecosystem services' concept
- To implement measures to raise awareness and disseminate the knowledge that has been collated
- To work on the theme of "The Species-rich Vattenriket"
- To ensure that the Biosphere Office continues to be an important player in the work to achieve a better balance in Hanöbukten Bay, both through specific active measures, programmes and educational and information dissemination initiatives (e.g. a new visitor site by the sea)
- To ensure that the Biosphere Office works to reverse the negative trend and create a positive development for the wet grasslands and wading birds in the biosphere reserve
- To work with other actors within the municipality to promote sustainable urban development in Kristianstad
- To work for projects linked to ecological and social sustainability (integration)
- To ensure that the Biosphere Office continues to be a player for the promotion of outdoor recreation and ecotourism in the region, by making available information and raising awareness concerning the valuable natural and cultural history of the area
- To ensure that Vattenriket continues to signpost the way out into the biosphere reserve and to attractive visitor sites (initiate a review of the biosphere reserve's visitor sites, and use new technologies and methods)
- To continue to link relevant ecological projects being carried out by the Biosphere Reserve with educational activities, information, programme activities and displays/exhibitions at visitor centres
- To further develop the work to highlight the health-promoting aspects of nature in the information dissemination and programme work (under the theme of 'The calming effect of nature' (*Lugn av naturen*)).

9. SUPPORTING DOCUMENTS

(1) Updated location and zonation map with coordinates

Download the shape files from <http://www.vattenriket.kristianstad.se/unesco/>



(2) Updated vegetation map or land cover map

[A vegetation map or land cover map showing the principal habitats and land cover types of the biosphere reserve should be provided, if available.]





(3) Updated list of legal documents (if possible with English, French or Spanish synthesis of its contents and a translation of its most relevant provisions)

[If applicable update the principal legal documents since the nomination of the biosphere reserve and provide a copy of these documents.]

Designated nature reserves pursuant to Chapter 7 Section 4 of the Swedish Environmental Code.

| Most recent decision date | Name | Area (ha) |
|----------------------------------|---------------------------|------------------|
| 10/03/1959 | Lyngsjö äng | 1 |
| 28/06/1968 | Håslöv ängar | 189 |
| 28/06/1968 | Fjälkinge backe | 190 |
| 12/08/1976 | Boarps hed | 30 |
| 12/08/1976 | Gropahålet | 32 |
| 09/12/1991 | Fredriksdalsviken | 92 |
| 06/05/1996 | Äspet | 216 |
| 26/11/1999 | Hercules | 93 |
| 26/03/2001 | Isternäset | 108 |
| 18/11/2002 | Näsby fält | 462 |
| 18/11/2002 | Rinkaby and Horna ängar | 192 |
| 14/10/2003 | Maltesholm | 29 |
| 13/12/2005 | Balsberget | 287 |
| 11/12/2006 | Forsakar | 38 |
| 24/10/2007 | Hovby ängar | 851 |
| 29/11/2007 | Egeside | 230 |
| 13/05/2008 | Degeberga backar | 31 |
| 02/02/2009 | Pulken - Yngsjö | 306 |
| 18/01/2011 | Årummet | 56 |
| 22/06/2011 | Horna sjömark | 158 |
| 08/09/2011 | Olarp | 45 |
| 15/09/2011 | Åby ängar | 124 |
| 20/10/2011 | Åsums ängar and Åsumallet | 448 |
| 09/02/2012 | Vramså | 102 |
| 26/04/2012 | Åbjär | 93 |
| 21/02/2013 | Björkerödsbäcken | 64 |
| 09/04/2013 | Horna Sandar | 52 |
| 13/06/2013 | Horna grushåla | 14 |
| 10/06/2014 | Sännarna | 45 |
| 18/09/2014 | Klintabäcken | 37 |
| | Total area | 4621 |

By the Swedish government in accordance with Chapter 7 Section 28 of the Swedish Environmental Code, designated Natura 2000 sites pursuant to the EU Habitats Directive (pSCI) and the EU Birds Directive (SPA).

| Government decision, pSCI | Government decision, SPA | Site code | Name | Area (ha), pSCI | Area (ha), SPA |
|---------------------------|--------------------------|-----------|-------------------------|-----------------|----------------|
| 21/12/1995 | | SE0420021 | Boarps hed | 30 | |
| 27/06/1996 | | SE0420128 | Torsebroparken | 14 | |
| | 19/12/1996 | SE0420146 | Araslövssjön | | 1133 |
| | 19/12/1996 | SE0420145 | Hammarsjön | | 2641 |
| | 19/12/1996 | SE0420144 | Vramsåns mynningsområde | | 95 |
| 30/01/1997 | | SE0420141 | Forsakar-Borråkra | 40 | |
| 30/01/1997 | | SE0420137 | Gropahålet | 77 | |
| 30/01/1997 | | SE0420203 | Klintabäcken | 21 | |
| 30/01/1997 | | SE0420202 | Maltesholm astle | 29 | |
| 30/01/1997 | | SE0420047 | Norra Mosslunda | 72 | |
| 30/01/1997 | | SE0420152 | Södra Äspet | 58 | |
| 30/01/1997 | | SE0420142 | Söndreklack | 32 | |
| 30/01/1997 | | SE0420138 | Äspet | 216 | |
| 22/12/1998 | | SE0420256 | Björkhäll | 36 | |
| 22/12/1998 | | SE0420261 | Egeside | 22 | |
| 22/12/1998 | | SE0420255 | Gamlegården | 19 | |
| 22/12/1998 | | SE0420258 | Hercules | 39 | |
| 22/12/1998 | | SE0420257 | Håslöv | 150 | |
| 22/12/1998 | | SE0420252 | Lingenäsen | 87 | |
| 22/12/1998 | | SE0420234 | Lyngby | 4.7 | |
| 22/12/1998 | | SE0420235 | Lyngsjön | 84 | |
| 22/12/1998 | | SE0420204 | Mjöans dalgång | 25 | |
| 22/12/1998 | | SE0420260 | Pulken | 7.6 | |
| 22/12/1998 | | SE0420239 | Rinkaby skjutfält | 775 | |
| 22/12/1998 | | SE0420236 | Vittskövle driva | 59 | |
| 22/12/1998 | | SE0420259 | Vramsåns mynning | 22 | |
| 22/12/1998 | | SE0420253 | Västra fäladen | 38 | |
| 22/12/1998 | | SE0420254 | Åsumallet | 40 | |
| 06/07/2000 | | SE0420280 | Everöds utmark | 37 | |
| 06/07/2000 | | SE0420282 | Prästängen | 15 | |
| 24/01/2002 | | SE0420308 | Araslövssjön | 369 | |
| 24/01/2002 | | SE0420316 | Balsbergsgrottan | 1.3 | |
| 24/01/2002 | | SE0420309 | Hammarsjön | 1797 | |
| 24/01/2002 | | SE0420307 | Helge å | 112 | |
| 24/01/2002 | | SE0420310 | Vramså | 242 | |
| 06/11/2003 | | SE0420324 | Balsberget | 195 | |
| | 22/12/1998 | SE0420264 | Egeside-Pulken-Yngsjön | | 507 |
| May 2006 | | SE0420328 | Stackedala | 14.6 | |
| Total area | | | | 4778 | 4376 |

By the Swedish Environmental Protection Agency in accordance with Chapter 3 Section 6 of the Swedish Environmental Code, designated as being of national interest for nature conservation.

| Decision date | Identification | Area name |
|----------------------|-----------------------|---|
| 07/02/2000 | NRO11025 | Tostebergakusten |
| 07/02/2000 | NRO11027 | Oppmanna - Ivösjö |
| 2000-02-07 | NRO11028 | Fjälkinge backe Lilles backe |
| 07/02/2000 | NRO11029 | Gummastorpasjön |
| 07/02/2000 | NRO11030 | Hallabacken |
| 07/02/2000 | NRO11031 | Helge åns nedre lopp |
| 07/02/2000 | NRO11032 | Mosslunda |
| 07/02/2000 | NRO11033 | Kusten Åhus - Juleboda |
| 07/02/2000 | NRO11034 | Lyngsjö |
| 07/02/2000 | NRO11035 | Linderödsåsens nordsluttning med vattendrag |
| 07/02/2000 | NRO11036 | Boarps fälad |
| 07/02/2000 | NRO11037 | Knopparp |
| 07/02/2000 | NRO12059 | Everöds Fälad |
| 07/02/2000 | NRO12022 | Fjällmossen |

Habitat protection areas in accordance with Chapter 7 Section 11 of the Swedish Environmental Code (SFS 1998:808).

| Case reference | Property | Decision date | Area | Type |
|-------------------|--------------------|---------------|-------------|---|
| FSK 120-1997 | BÖKESTORP 15:1 | 13/06/1997 | 2.6 | Natural and near-natural old-growth forests |
| FSK 125-2005 | ÖLLESTORP 1:2 | 15/02/2005 | 2.2 | Natural and near-natural old-growth forests |
| FSK 126-2005 | ÖLLESTORP 1:2 | 15/02/2005 | 6.6 | Natural and near-natural old-growth forests |
| FSK 158-1999 | TORSEKE 22:2 | 14/06/1999 | 1.6 | Natural and near-natural old-growth forests |
| FSK 16-2008 | LINDERÖD 1:1 | 14/01/2008 | 8.6 | Natural and near-natural old-growth forests |
| FSK 162-1996 | VITTSKÖVLE 95:1 | 20/09/1996 | 3.6 | Natural and near-natural old-growth forests |
| FSK 216-2012 | NORRA PÅRUP 4:1 | 11/12/2012 | 1 | Alder groves rich in vascular plants |
| FSK 220-2013 | BASSKÖP 1:8 | 13/05/2014 | 0.7 | Alder fens |
| FSK 222-2012 | NORRA PÅRUP 4:1 | 04/09/2012 | 4 | Natural and near-natural old-growth forests |
| FSK 225-2012 | NORRA PÅRUP 4:1 | 11/12/2012 | 0.3 | Alder fens |
| FSK 235-2012 | LIARUM 5:3 | 03/01/2013 | 2.57 | Natural and near-natural old-growth forests |
| FSK 236-2012 | LIARUM 5:3 | 03/01/2013 | 1.88 | Natural and near-natural old-growth forests |
| FSK 237-2012 | LIARUM 5:3 | 03/01/2013 | 4.8 | Brooks and other small aquatic biotopes |
| FSK 238-2012 | LIARUM 5:3 | 03/01/2013 | 1.83 | Brooks and other small aquatic biotopes |
| FSK 239-2012 | LIARUM 7:1 | 03/01/2013 | 0.59 | Brooks and other small aquatic biotopes |
| FSK 266-2003 | LINDERÖD 5:11 | 10/03/2003 | 0.9 | Alder fens |
| FSK 269-1996 | STENSMA 5:7 | 12/12/1996 | 0.7 | Alder fens |
| FSK 270-1996 | STENSMA 5:5 | 12/12/1996 | 0.8 | Alder fens |
| FSK 289-2003 | LINDERÖD 3:45 | 18/03/2003 | 1.8 | Alder fens |
| FSK 290-2003 | LINDERÖD 3:45 | 18/03/2003 | 0.6 | Natural and near-natural old-growth forests |
| FSK 292-2013 | LINDERÖD 07:59 | 13/11/2013 | 0.68 | Natural and near-natural old-growth forests |
| FSK 298-2001 | SKÅTTILLJUNGA 22:8 | 18/06/2001 | 3.6 | Alder fens |
| FSK 307-2010 | ABULLABERGA 1:4 | 26/11/2010 | 0.5 | Alder fens |
| FSK 308-2010 | ABULLABERGA 1:4 | 26/11/2010 | 6.7 | Natural and near-natural old-growth forests |
| FSK 309-2010 | ABULLABERGA 1:4 | 26/11/2010 | 1.1 | Alder fens |
| FSK 353-2013 | LINDERÖD 7:59 | 13/11/2013 | 0.24 | Brooks and other small aquatic biotopes |
| FSK 354-2013 | LINDERÖD 7:59 | 13/11/2013 | 0.43 | Natural and near-natural old-growth forests |
| FSK 355-2013 | LINDERÖD 7:59 | 13/11/2013 | 3.76 | Alder fens |
| FSK 37-2006 | VENESTAD 54:1 | 16/01/2006 | 1.3 | Alder fens |
| FSK 43-2004 | KARSHOLM 1:4 | 15/01/2004 | 1.2 | Natural and near-natural old-growth forests |
| FSK 456-2013 | ULLARP 3:3 | 18/12/2013 | 0.8 | Natural and near-natural old-growth forests |
| FSK 543-2002 | OVESHOLM 1:1 | 27/06/2002 | 1 | Natural and near-natural old-growth forests |
| FSK 544-2002 | OVESHOLM 1:1 | 27/06/2002 | 0.8 | Natural and near-natural old-growth forests |
| FSK 55-2013 | HOLMÖ 1:32 | 29/10/2013 | 0.3 | Natural and near-natural old-growth forests |
| FSK 629-2012 | NORRA PÅRUP 4:1 | 03/02/2014 | 0.8 | Natural and near-natural old-growth forests |
| FSK 63-2008 | VENESTAD 21:3 | 18/02/2008 | 1.9 | Areas with ancient trees |
| FSK 747-2005 | STRÖ 25:4 | 03/11/2005 | 2.6 | Areas with ancient trees |
| FSK 783-2006 | LINDERÖD 1:1 | 12/12/2006 | 9.7 | Natural and near-natural old-growth forests |
| FSK 784-2001 | KNUTSTORP 2:7 | 12/12/2001 | 3.8 | Natural and near-natural old-growth forests |
| FSK 785-2001 | KNUTSTORP 2:7 | 12/12/2001 | 1 | Brooks and other small aquatic biotopes |
| FSK 786-2001 | KNUTSTORP 2:7 | 12/12/2001 | 0.8 | Brooks and other small aquatic biotopes |
| FSK 789-2012 | NORRA PÅRUP 4:1 | 03/02/2014 | 0.8 | Areas with ancient trees |
| FSK 790-2012 | NORRA PÅRUP 4:1 | 03/02/2014 | 0.8 | Natural and near-natural old-growth forests |
| Total area | | | 92.3 | |

(4) Updated list of land use and management/cooperation plans

[List existing land use and management/cooperation plans (with dates and reference numbers) for the administrative area(s) included within the biosphere reserve. Provide a copy of these documents. It is recommended to produce an English, French or Spanish synthesis of its contents and a translation of its most relevant provisions.]

Comprehensive plan for Kristianstad Municipality

A new comprehensive plan was adopted by the Municipal council on 12 March 2013.

Established action plan and designated management plans for nature reserves in Kristianstads Vattenrike Biosphere Reserve

Action plan: Municipal nature conservation - sub programme for nature conservation and outdoor recreation (municipal nature conservation fund), revised 21 June 2006, Kristianstad Municipality.

| Nature reserve | Reserve decision | Management plan decision |
|-----------------------|-------------------------|---------------------------------|
| Balsberget | 13/12/2005 | 11/05/2009 |
| Björkerödsbäcken | 21/02/2013 | 21/02/2013 |
| Boarps hed | 08/12/1976 | 13/06/1991 |
| Degeberga backar | 13/05/2008 | 13/05/2008 |
| Egeside | 29/11/2007 | 10/12/2007 |
| Fjälkinge backe | 28/06/1968 | 26/07/1993 |
| Forsakar | 11/12/2006 | 11/12/2006 |
| Fredriksdalsviken | 09/12/1991 | 09/12/1991 |
| Gropahålet | 08/12/1976 | 10/12/2008 |
| Hercules | 26/11/1999 | 26/11/1999 |
| Horna grushåla | 13/06/2013 | 13/06/2013 |
| Horna Sandar | 09/04/2013 | 09/04/2013 |
| Horna sjömark | 22/06/2011 | 22/06/2011 |
| Hovby ängar | 24/10/2007 | 24/10/2007 |
| Håslöv ängar | 25/04/1967 | 20/11/2006 |
| Isternäset | 26/03/2001 | 26/03/2001 |
| Klintabäcken | 18/09/2014 | 18/09/2014 |
| Lyngsjö äng | 10/03/1959 | - |

| | | |
|---------------------------|------------|------------|
| Maltesholm | 14/10/2003 | 14/10/2003 |
| Näsby fält | 18/11/2002 | 18/11/2002 |
| Olarp | 08/09/2011 | 04/12/2014 |
| Pulken - Yngsjö | 02/02/2009 | 02/02/2009 |
| Rinkaby and Horna ängar | 18/11/2002 | 18/11/2002 |
| Sännarna | 10/06/2014 | 10/06/2014 |
| Vramså | 09/02/2012 | 09/02/2012 |
| Åbjär | 26/04/2012 | 26/04/2012 |
| Åby ängar | 15/09/2011 | 15/09/2011 |
| Årummet | 18/01/2011 | 18/01/2011 |
| Åsums ängar and Åsumallet | 20/10/2011 | 20/10/2011 |
| Äspet | 06/05/1996 | 06/05/1996 |

(5) Updated species list (to be annexed)

[Provide a list of important species occurring within the proposed biosphere reserve, including common names, wherever possible.]

The lists attached provide an account of international and national red-listed species occurring in the biosphere reserve.

The Swedish Species Information Centre (ArtDatabanken) works with biodiversity, serving as the focal point for information on threatened species and biodiversity in Sweden. Its main tasks are to collect, evaluate and store the most important information about threatened and rare plant and animal species. A basic part of this work is to assess the types and degrees of threat, and to prepare the national Red List and Red Data Books.

ArtDatabanken is an active member of the International Union for Conservation of Nature (IUCN) and the updating of the red lists are made in accordance with the of IUCN and with the same categorisation.

| | | | |
|------------|---|--|--------|
| Rödlistade | Kunskapsbrist – DD (Data Deficient) | Försvunnen – RE (Regionally Extinct) | Hotade |
| | | Akut hotad – CR (Critically Endangered) | |
| | | Starkt hotad – EN (Endangered) | |
| | | Sårbar – VU (Vulnerable) | |
| | | Missgynnad – NT (Near Threatened) | |
| | | Livskraftig – LC (Least Concern) Rödlistas ej | |

Species that are characterised as *Data Deficient (DD)*, *Regionally extinct (RE)*, *Critically Endangered (CR)*, *Endangered (EN)*, *Vulnerable (VU)* and *Near Threatened (NT)* are designated as *red-listed*.

Red-listed species that can be characterised as *Critically Endangered (CR)*, *Endangered (EN)* or *Vulnerable (VU)* are designated as *threatened*.

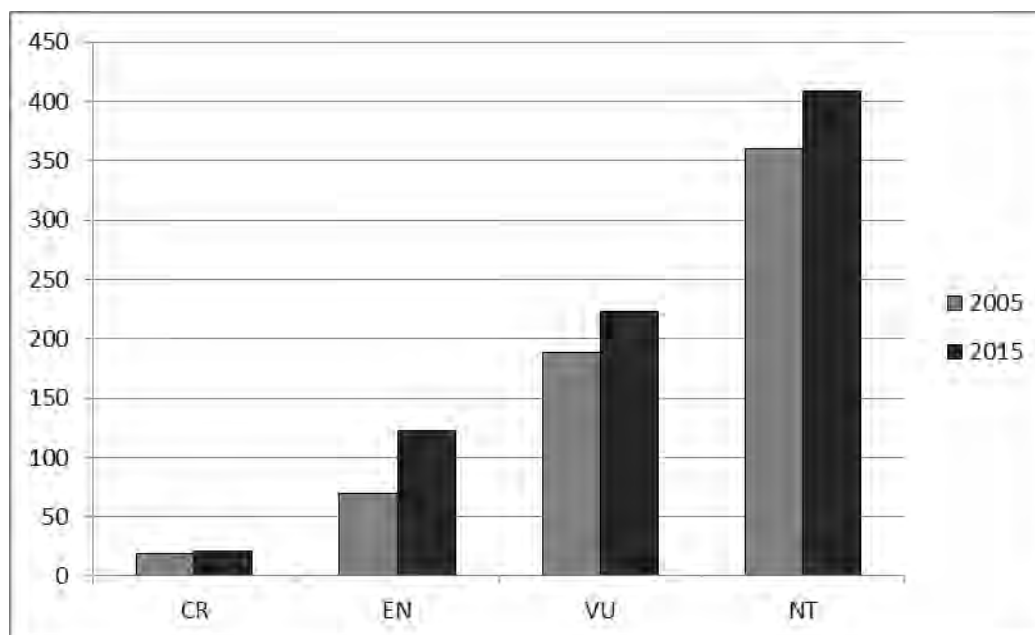
The English designations have been used in the abbreviation of the categories in order to facilitate comparisons between countries.

Changes in the species lists between 2005 and 2015

Lists were produced of known threatened species in the area in 2005 in connection with the application for the approval of Kristianstads Vattenrike as a biosphere reserve. Since then there has been an intensive knowledge-building through both new inventories and compilations of existing knowledge. Knowledge of biodiversity and species in the biosphere reserve has consequently increased significantly as a whole during the last ten years. The national red lists have been revised twice during the same period (2005 and 2010) with major changes to the lists. Overall, the number of known red-listed species in the reserve has increased from 637 (of which 277 are threatened) to 775 (of which 366 are threatened) during the period 2005-2015 (see figure below).

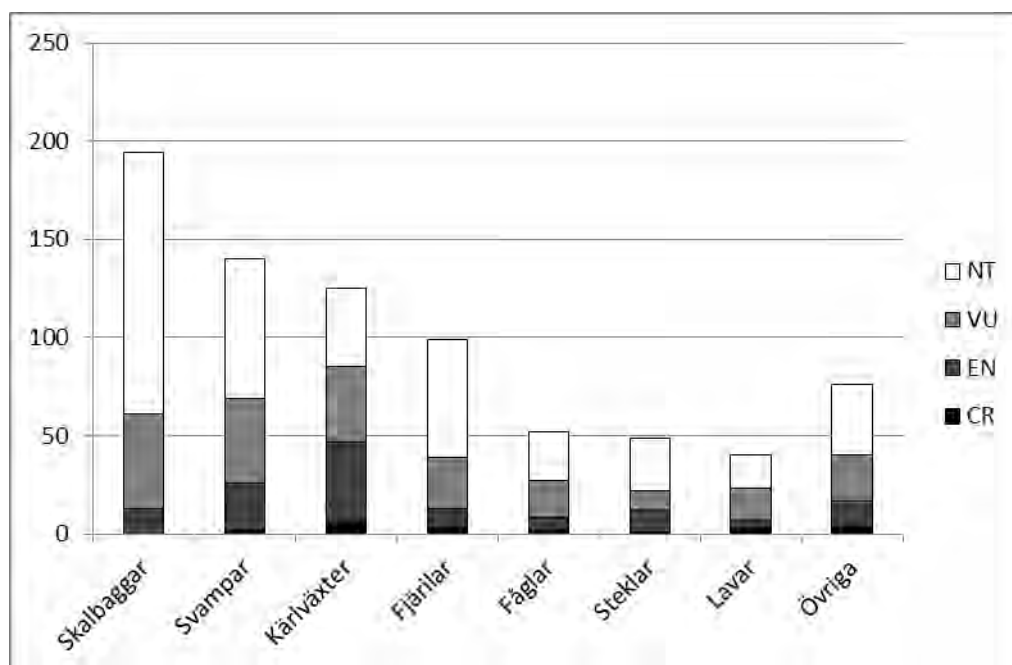
The revisions of the national red lists have led to major changes to the species content in the lists for the biosphere reserve. The main reason for the increase in the total number of red-listed species is the knowledge building that has taken place since 2005. Many new localities of previously known species have also been discovered. However, it is difficult to draw conclusions regarding how the status of threatened species has changed generally in the

biosphere reserve during the last ten years. To be able to perform such analyses we need more and targeted monitoring over longer time.



Number of red-listed species in Kristianstads Vattenrike in 2005 and 2015. The number of known red-listed species has increased from 637 species in 2005 to 775 species in 2015. The threat categories for 2005 follow the national red list from 2000, while the national red list from 2010 forms the basis for 2015.

Overview of red-listed species



Number of red-listed species (n=775) in the biosphere reserve divided according to organism group.

Beetles (194 species, “skalbaggar” in the table above) are the largest group of organisms with regard to the number of known red-listed species in the biosphere reserve, followed by fungi (140 species), vascular plants (125 species) and butterflies (99 species). Birds, hymenoptera and lichens are also groups containing many red-listed species. The 'other' (“Övriga”) group in

the table above includes mosses (15 species), molluscs (11 species), dragonflies (11 species), diptera (ten species), arachnids (ten species), mammals (four species), fish, (four species), hemiptera (four species), amphibians and reptiles (three species), stoneworts (two species), crustaceans (one species) and algae (one species).

The majority of threatened species (CR, EN and VU) are found among vascular plants with 85 species of which six are critically endangered. In total, there are at the moment 366 threatened known species in the biosphere reserve, which therefore forms one of the main regions of the country with regard to the occurrence of threatened species.

Global red-listed species

Species in the biosphere reserve that are global red-listed species in accordance with the IUCN Red List of threatened species:

| Group | Latin name | English name | IUCN category | Occurrence in biosphere reserve |
|-------------|------------------------------------|----------------------------|---------------|---------------------------------|
| Mammals | <i>Myotis dasycneme</i> | Pond Bat | NT | Occasional |
| Mammals | <i>Sciurus vulgaris</i> | Eurasian Red Squirrel | LC | Common |
| Birds | <i>Crex crex</i> | Corncrake | LC | Occasional |
| Birds | <i>Gallinago media</i> | Great Snipe | NT | Rare, resting |
| Birds | <i>Haliaeetus albicilla</i> | White-tailed Eagle | LC | Common during |
| Fish | <i>Gadus morhua</i> | Atlantic Cod | VU | Common |
| Fish | <i>Lampetra fluviatilis</i> | European River Lamprey | LC | Occasional |
| Fish | <i>Lampetra planeri</i> | Brook Lamprey | LC | Rare |
| Fish | <i>Pelecus cultratus</i> | Ziege | LC | Occasional |
| Beetles | <i>Carabus intricatus</i> | Blue Ground Beetle | NT | Rare |
| Beetles | <i>Dytiscus latissimus</i> | No common English | VU | Common |
| Beetles | <i>Osmoderma eremita</i> | Hermit Beetle | NT | Rare |
| Dragonflies | <i>Aeshna viridis</i> | Green Hawker | LC | Rare |
| Butterflies | <i>Maculinea arion</i> | Large Blue | NT | Rare |
| Arachnids | <i>Dolomedes plantarius</i> | Great Raft Spider | VU | Rare |
| Hymenoptera | <i>Formica rufa</i> | Red Wood Ant | NT | Common |
| Hymenoptera | <i>Lasioglossum breviventre</i> | No common English name | EN | Rare |
| Crustaceans | <i>Astacus astacus</i> | Noble Crayfish | VU | Occurrence uncertain |
| Molluscs | <i>Margaritifera margaritifera</i> | Freshwater Pearl Mussel | EN | Rare |
| Molluscs | <i>Pseudanodonta complanata</i> | Depressed River Mussel | VU | Rare |
| Molluscs | <i>Vertigo angustior</i> | Narrow-mouthed Whorl Snail | NT | Rare |
| Molluscs | <i>Vertigo geyerii</i> | Geyer's Whorl Snail | LC | Rare |

Categories of the IUCN red list above: Critically endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC)

EU listed species

The EU Habitats and Birds Directives list over 900 plant and animal species and more than 170 habitats that are threatened or unique from a European perspective. The following list indicates the species present in the biosphere reserve and that are included in Annex II of the Habitats Directive and Annex I of the Birds Directive.

Species in the biosphere reserve that are listed in the EU Birds Directive (Annex I) and the EU Habitats Directive (Annex II).

| Group | Latin name | English name | EU code |
|---|---------------------------------|----------------------|---------|
| Species included in the Birds Directive (Annex I) regularly breeding or resting in the reserve | | | |
| Birds | <i>Alcedo atthis</i> | Kingfisher | A229 |
| Birds | <i>Anthus campestris</i> | Tawny Pipit | A255 |
| Birds | <i>Aquila chrysaetos</i> | Golden Eagle | A091 |
| Birds | <i>Asio flammeus</i> | Short-eared Owl | A222 |
| Birds | <i>Botaurus stellaris</i> | Eurasian Bittern | A021 |
| Birds | <i>Branta leucopsis</i> | Barnacle Goose | A045 |
| Birds | <i>Bubo bubo</i> | Eagle Owl | A215 |
| Birds | <i>Calidris alpina schinzii</i> | Dunlin | A466 |
| Birds | <i>Caprimulgus europaeus</i> | Nightjar | A224 |
| Birds | <i>Chlidonias niger</i> | Black Tern | A197 |
| Birds | <i>Ciconia ciconia</i> | White Stork | A031 |
| Birds | <i>Circus aeruginosus</i> | Marsh Harrier | A081 |
| Birds | <i>Circus cyaneus</i> | Hen Harrier | A082 |
| Birds | <i>Circus pygargus</i> | Montagu's Harrier | A084 |
| Birds | <i>Cygnus cygnus</i> | Whooper Swan | A038 |
| Birds | <i>Crex crex</i> | Corn Crake | A122 |
| Birds | <i>Dryocopus martius</i> | Black Woodpecker | A236 |
| Birds | <i>Emberiza hortulana</i> | Ortolan Bunting | A379 |
| Birds | <i>Falco columbarius</i> | Merlin | A098 |
| Birds | <i>Falco peregrinus</i> | Peregrine Falcon | A103 |
| Birds | <i>Gallinago media</i> | Great Snipe | A154 |
| Birds | <i>Gavia arctica</i> | Black-throated Diver | A002 |
| Birds | <i>Gavia stellata</i> | Red-throated Diver | A001 |
| Birds | <i>Grus grus</i> | Common Crane | A127 |
| Birds | <i>Haliaeetus albicilla</i> | White-tailed Eagle | A075 |
| Birds | <i>Lanius collurio</i> | Red-backed Shrike | A338 |
| Birds | <i>Limosa lapponica</i> | Bar-tailed Godwit | A157 |
| Birds | <i>Lullula arborea</i> | Woodlark | A246 |
| Birds | <i>Mergus albellus</i> | Smew | A068 |
| Birds | <i>Milvus milvus</i> | Red Kite | A074 |
| Birds | <i>Pandion haliaetus</i> | Osprey | A094 |
| Birds | <i>Pernis apivorus</i> | Honey Buzzard | A072 |
| Birds | <i>Philomachus pugnax</i> | Ruff | A151 |
| Birds | <i>Porzana porzana</i> | Spotted Crake | A119 |
| Birds | <i>Recurvirostra avosetta</i> | Avocet | A132 |
| Birds | <i>Sterna albifrons</i> | Little Tern | A195 |

| | | | |
|---|------------------------------------|------------------------------|------|
| Birds | <i>Sterna caspia</i> | Caspian Tern | A190 |
| Birds | <i>Sterna hirundo</i> | Common Tern | A193 |
| Birds | <i>Sterna paradisaea</i> | Arctic Tern | A194 |
| Birds | <i>Sterna sandvicensis</i> | Sandwich Tern | A191 |
| Birds | <i>Sylvia nisoria</i> | Barred Warbler | A307 |
| Birds | <i>Tetrao tetrix tetrix</i> | Black Grouse | A409 |
| Birds | <i>Tringa glareola</i> | Wood Sandpiper | A166 |
| Species included in the Habitats Directive (Annex II) occurring in the reserve | | | |
| Mammals | <i>Myotis dasycneme</i> | Pond Bat | 1318 |
| Reptiles and amphibians | <i>Triturus cristatus</i> | Northern Crested Newt | 1166 |
| Fish | <i>Cottus gobio</i> | Bullhead | 1163 |
| Fish | <i>Salmo salar</i> | Atlantic Salmon | 1106 |
| Butterflies | <i>Hesperia comma catena</i> | Silver-spotted Skipper | 1933 |
| Beetles | <i>Dytiscus latissimus</i> | No common English name known | 1081 |
| Beetles | <i>Lucanus cervus</i> | Stag Beetle | 1083 |
| Beetles | <i>Osmoderma eremita</i> | Hermit Beetle | 1084 |
| Arachnids | <i>Anthrenochernes stellae</i> | No common English name known | 1936 |
| Molluscs | <i>Margaritifera margaritifera</i> | Freshwater Pearl Mussel | 1029 |
| Molluscs | <i>Unio Crassius</i> | Thick shelled River Mussel | 1032 |
| Molluscs | <i>Vertigo geyerii</i> | Geyer's Whorl Snail | 1013 |
| Molluscs | <i>Vertigo angustior</i> | Narrow-mouthed Whorl Snail | 1014 |
| Vascular plants | <i>Dianthus arenarius</i> | Sand pink | 1954 |
| Vascular plants | <i>Liparis loeselii</i> | Fen orchid | 1903 |
| Vascular plants | <i>Najas flexilis</i> | Slender Naiad | 1833 |

National red-listed species under the category 'Critically endangered' (CR)

Species listed to date in the biosphere reserve that are nationally red-listed in accordance with ArtDatabanken 2010 under the category (CR: Critically Endangered).

CR – 21 species (six species remaining from the list in the application)

| Group | Latin name | English name |
|-----------------|---------------------------------|------------------------------|
| Mammals | <i>Myotis bechsteinii</i> | Bechstein's Bat |
| Fish | <i>Anguilla anguilla</i> | European eel |
| Birds | <i>Calidris alpina schinzii</i> | Dunlin |
| Birds | <i>Limosa limosa</i> | Black-tailed Godwit |
| Butterflies | <i>Cochylimorpha hilarana</i> | No common English name known |
| Butterflies | <i>Lithostege griseata</i> | Grey Carpet |
| Butterflies | <i>Cucullia argentea</i> | Green silver spangled shark |
| Crustaceans | <i>Astacus astacus</i> | Noble Crayfish |
| Arachnids | <i>Alopecosa cursor</i> | No common English name known |
| Hymenoptera | <i>Leptothorax goeswaldi</i> | No common English name known |
| Vascular plants | <i>Ajuga genevensis</i> | Upright Bugle |
| Vascular plants | <i>Arenaria leptoclados</i> | Thyme-leafed Sandwort |
| Vascular plants | <i>Minuartia viscosa</i> | No common English name known |
| Vascular plants | <i>Rosa agrestis</i> | Small-leaved sweet-briar |
| Vascular plants | <i>Rosa micrantha</i> | Small-flowered sweet-briar |
| Vascular plants | <i>Taraxacum austrinum</i> | No common English name known |
| Lichens | <i>Cyphelium notarisii</i> | Notaris' Soot lichen |
| Lichens | <i>Cyphelium trachylioides</i> | Soot lichen |
| Lichens | <i>Diploicia canescens</i> | No common English name known |
| Mushrooms | <i>Hericium erinaceus</i> | Lion's mane mushroom |
| Mushrooms | <i>Tulostoma melanocyclus</i> | Scaly Stalkball |

National red-listed species under the category 'Endangered' (EN)

Species listed to date in the biosphere reserve that are nationally red-listed in accordance with ArtDatabanken 2010 under the category (EN: Endangered).

EN – -122 species (34 species remaining from the list in the application)

| Group | Latin name | English name |
|-------------|------------------------------------|------------------------------|
| Mammals | <i>Myotis dasycneme</i> | Pond Myotis |
| Fish | <i>Silurus glanis</i> | European catfish |
| Birds | <i>Anthus campestris</i> | Tawny pipit |
| Birds | <i>Carduelis flavirostris</i> | Twite |
| Birds | <i>Circus pygargus</i> | Montagu's harrier |
| Birds | <i>Oriolus oriolus</i> | Golden oriole |
| Birds | <i>Remiz pendulinus</i> | Penduline tit |
| Birds | <i>Sterna sandvicensis</i> | Sandwich tern |
| Molluscs | <i>Cochlicopa nitens</i> | Robust pillar |
| Molluscs | <i>Margaritifera margaritifera</i> | Freshwater pearl mussel |
| Molluscs | <i>Unio crassus</i> | Thick shelled river mussel |
| Butterflies | <i>Brachmia dimidiella</i> | No common English name known |
| Butterflies | <i>Caryocolum schleichi</i> | No common English name known |
| Butterflies | <i>Coleophora chalcogrammella</i> | Pointed case-bearer |
| Butterflies | <i>Coleophora gnaphalii</i> | Ochreous case-bearer |
| Butterflies | <i>Eublemma minutata</i> | Scarce marbled |
| Butterflies | <i>Hemistola chrysoprasaria</i> | Small emerald |
| Butterflies | <i>Horisme aquata</i> | Cumbrian umber |
| Butterflies | <i>Lycia zonaria</i> | Belted beauty |
| Butterflies | <i>Myelois cirrigerella</i> | No common English name known |
| Butterflies | <i>Pyrausta aerealis</i> | No common English name known |
| Hemiptera | <i>Adelphocoris ticinensis</i> | No common English name known |
| Beetles | <i>Allecula rhenana</i> | No common English name known |
| Beetles | <i>Aphodius quadriguttatus</i> | Night-flying dung beetle |
| Beetles | <i>Chalcophora mariana</i> | Flatheaded pine borer |
| Beetles | <i>Corticeus longulus</i> | Pine shoot beetle |
| Beetles | <i>Denticollis rubens</i> | No common English name known |
| Beetles | <i>Harpalus hirtipes</i> | No common English name known |
| Beetles | <i>Heptaulacus sus</i> | No common English name known |
| Beetles | <i>Leptura revestita</i> | No common English name known |
| Beetles | <i>Maladera holosericea</i> | No common English name known |
| Beetles | <i>Margarinotus carbonarius</i> | No common English name known |
| Beetles | <i>Melandrya barbata</i> | No common English name known |
| Beetles | <i>Nicrophorus vestigator</i> | No common English name known |
| Beetles | <i>Squamapion oblivium</i> | No common English name known |
| Arachnids | <i>Micaria lenzi</i> | No common English name known |
| Hymenoptera | <i>Andrena bluethgeni</i> | No common English name known |
| Hymenoptera | <i>Andrena chrysopyga</i> | No common English name known |
| Hymenoptera | <i>Andrena humilis</i> | No common English name known |
| Hymenoptera | <i>Andrena morawitzi</i> | No common English name known |

| | | |
|-----------------|---|------------------------------|
| Hymenoptera | <i>Dufourea inermis</i> | No common English name known |
| Hymenoptera | <i>Halictus leucaheneus</i> | No common English name known |
| Hymenoptera | <i>Nomada armata</i> | Scabious cuckoo bee |
| Hymenoptera | <i>Nomada fuscicornis</i> | No common English name known |
| Hymenoptera | <i>Osmia maritima</i> | Mason bee |
| Hymenoptera | <i>Pterocheilus phaleratus</i> | No common English name known |
| Hymenoptera | <i>Tiphia unicolor</i> | No common English name known |
| Diptera | <i>Machimus arthriticus</i> | No common English name known |
| Algae | <i>Nitella capillaris</i> | Slimy-fruited stonewort |
| Vascular plants | <i>Agrostemma githago</i> | Common corncockle |
| Vascular plants | <i>Anthericum liliago</i> | St. Bernard's lily |
| Vascular plants | <i>Astragalus arenarius</i> | Arenarious Milk-vetch |
| Vascular plants | <i>Arnoseris minima</i> | Swine's succory |
| Vascular plants | <i>Botrychium matricariifolium</i> | Chamomile grape-fern |
| Vascular plants | <i>Carex obtusata</i> | Obtuse sedge |
| Vascular plants | <i>Chimaphila umbellata</i> | Umbellate Wintergreen |
| Vascular plants | <i>Dianthus arenarius</i> | Sand pink |
| Vascular plants | <i>Eryngium maritimum</i> | Sea holly |
| Vascular plants | <i>Euphrasia rostkoviana ssp. rostkoviana</i> | No common English name known |
| Vascular plants | <i>Gentianella campestris ssp. baltica</i> | No common English name known |
| Vascular plants | <i>Gypsophila muralis</i> | Gypsy deep rose |
| Vascular plants | <i>Helosciadium inundatum</i> | Lesser marshwort |
| Vascular plants | <i>Hypericum humifusum</i> | Trailing St. John's wort |
| Vascular plants | <i>Isolepis setacea</i> | Bristle club rush |
| Vascular plants | <i>Jacobaea paludosa</i> | No common English name known |
| Vascular plants | <i>Juncus capitatus</i> | Leafybract dwarf rush |
| Vascular plants | <i>Koeleria glauca</i> | Blue hair grass |
| Vascular plants | <i>Lappula squarrosa</i> | European stickseed |
| Vascular plants | <i>Medicago minima</i> | Bur Medick |
| Vascular plants | <i>Mentha x gracilis</i> | Ginger mint |
| Vascular plants | <i>Misopates orontium</i> | Corn snapdragon |
| Vascular plants | <i>Najas flexilis</i> | Slender Naiad |
| Vascular plants | <i>Nasturtium officinale</i> | Water-cress |
| Vascular plants | <i>Neslia paniculata</i> | Ball mustard |
| Vascular plants | <i>Nepeta cataria</i> | Catnip |
| Vascular plants | <i>Oenanthe fistulosa</i> | Tubular water-dropwort |
| Vascular plants | <i>Ornithopus perpusillus</i> | Serradella |
| Vascular plants | <i>Orobanche reticulata</i> | Thistle broomrape |
| Vascular plants | <i>Peucedanum oreoselinum</i> | No common English name known |
| Vascular plants | <i>Phleum arenarium</i> | Sand cat's tail |
| Vascular plants | <i>Potamogeton rutilis</i> | Shetland pondweed |
| Vascular plants | <i>Potentilla heptaphylla</i> | No common English name known |
| Vascular plants | <i>Pseudorchis albida</i> | Small white orchid |
| Vascular plants | <i>Ranunculus fluitans</i> | River water-crowfoot |
| Vascular plants | <i>Rumex conglomeratus</i> | Clustered dock |
| Vascular plants | <i>Salvia verticillata</i> | Lilac sage |
| Vascular plants | <i>Sherardia arvensis</i> | Field madder |
| Vascular plants | <i>Taraxacum discretum</i> | Dandelion |
| Vascular plants | <i>Verbascum densiflorum</i> | Mullein |

| | | |
|-----------------|-------------------------------------|------------------------------|
| Vascular plants | <i>Veronica praecox</i> | Breckland speedwell |
| Lichens | <i>Caloplaca luteoalba</i> | Orange-fruited elm lichen |
| Lichens | <i>Catinaria laureri</i> | Laurer's Catillaria |
| Lichens | <i>Punctelia jeckeri</i> | No common English name known |
| Lichens | <i>Pyrenula nitidella</i> | No common English name known |
| Mosses | <i>Didymodon sinuosus</i> | Wavy beard-moss |
| Mosses | <i>Pseudocrossidium revolutum</i> | Revolute beard-moss |
| Mosses | <i>Rhynchostegium megapolitanum</i> | No common English name known |
| Mosses | <i>Syntrichia laevipila</i> | Small hairy screw-moss |
| Fungi | <i>Albatrellus cristatus</i> | No common English name known |
| Fungi | <i>Cortinarius bergeronii</i> | Violet webcap mushroom |
| Fungi | <i>Cortinarius elegantissimus</i> | No common English name known |
| Fungi | <i>Cortinarius foetens</i> | No common English name known |
| Fungi | <i>Cortinarius fulvocitrinus</i> | No common English name known |
| Fungi | <i>Cortinarius sodagnitus</i> | Bitter bigfoot webcap |
| Fungi | <i>Disciseda bovista</i> | No common English name known |
| Fungi | <i>Echinoderma calcicola</i> | No common English name known |
| Fungi | <i>Echinidema hystrix</i> | No common English name known |
| Fungi | <i>Ganoderma australe</i> | Southern bracket fungus |
| Fungi | <i>Geastrum berkeleyi</i> | Berkeley's earthstar |
| Fungi | <i>Geastrum florissome</i> | No common English name known |
| Fungi | <i>Geastrum pseudolimbatum</i> | No common English name known |
| Fungi | <i>Geastrum saccatum</i> | Rounded earthstar |
| Fungi | <i>Hygrophorus arbustivus</i> | Forest woodwax |
| Fungi | <i>Leccinum crocipodium</i> | Saffron bolete |
| Fungi | <i>Lepiota fuscovinacea</i> | No common English name known |
| Fungi | <i>Ramaria roellini</i> | No common English name known |
| Fungi | <i>Ramaria subbotrytis</i> | No common English name known |
| Fungi | <i>Tricholoma pardinum</i> | Leopard knight |
| Fungi | <i>Tulostoma fimbriatum</i> | No common English name known |
| Fungi | <i>Tulostoma kotlabae</i> | No common English name known |
| Fungi | <i>Xerocomus pelletieri</i> | No common English name known |
| Fungi | <i>Xylaria corniformis</i> | No common English name known |

National red-listed species under the category 'Vulnerable' (VU)

Species listed to date in the biosphere reserve that are nationally red-listed in accordance with ArtDatabanken 2010 under the category (VU: Vulnerable).

VU – 223 species (88 species remaining from the list in the application)

| Group | Latin name | English name |
|-------------------------|------------------------------|------------------------------|
| Mammals | <i>Lutra lutra</i> | Eurasian Otter |
| Mammals | <i>Myotis natterii</i> | Natterer's bat |
| Birds | <i>Alcedo atthis</i> | Kingfisher |
| Birds | <i>Anas querquedula</i> | Garganey |
| Birds | <i>Arenaria interpres</i> | Ruddy turnstone |
| Birds | <i>Aythya marila</i> | Greater scaup |
| Birds | <i>Calidris pugnax</i> | Ruff |
| Birds | <i>Carduelis cannabina</i> | Linnet |
| Birds | <i>Carpocacus erythrinus</i> | Common rosefinch |
| Birds | <i>Chlidonias niger</i> | Black tern |
| Birds | <i>Emberiza hortulana</i> | Ortolan bunting |
| Birds | <i>Falco peregrinus</i> | Peregrine falcon |
| Birds | <i>Hydropogon caspia</i> | Caspian tern |
| Birds | <i>Limosa lapponica</i> | Bar-tailed godwit |
| Birds | <i>Motacilla flava flava</i> | Blue-headed wagtail |
| Birds | <i>Pernis apivorus</i> | Honey buzzard |
| Birds | <i>Numenius arquata</i> | Eurasian curlew |
| Birds | <i>Porzana porzana</i> | Spotted crane |
| Birds | <i>Serinus serinus</i> | Serin |
| Birds | <i>Sterna albifrons</i> | Little tern |
| Birds | <i>Sylvia nisoria</i> | Barred warbler |
| Amphibians and reptiles | <i>Bufo calamita</i> | Natterjack toad |
| Amphibians and reptiles | <i>Lacerta agilis</i> | Sand lizard |
| Amphibians and reptiles | <i>Rana dalmatina</i> | Aghile frog |
| Butterflies | <i>Agriphila poliellus</i> | Grey grass-veener |
| Butterflies | <i>Bacotia claustralla</i> | No common English name known |
| Butterflies | <i>Clepsia pallidana</i> | No common English name known |
| Butterflies | <i>Coleophora scabrida</i> | No common English name known |
| Butterflies | <i>Coleophora gnaphalii</i> | Ochreous case-bearer |
| Butterflies | <i>Coleophora ochrea</i> | Large buff case-bearer |
| Butterflies | <i>Cucullia praecana</i> | No common English name known |
| Butterflies | <i>Denisia albimaculea</i> | White spotted black |
| Butterflies | <i>Dichomeris limosella</i> | No common English name known |
| Butterflies | <i>Ecliptopera capitata</i> | No common English name known |
| Butterflies | <i>Emmelia trabealis</i> | Spotted sulphur |
| Butterflies | <i>Eupithecia immundata</i> | No common English name known |
| Butterflies | <i>Eustroma reticulata</i> | Netted carpet moth |
| Butterflies | <i>Heliothela wulfeniana</i> | No common English name known |
| Butterflies | <i>Heliothis viriplaca</i> | Marbled clover |
| Butterflies | <i>Heterogenea asella</i> | Triangle |
| Butterflies | <i>Nemophora metallica</i> | Brassy long-horn |

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|-------------|-------------------------------------|------------------------------|
| Butterflies | <i>Polymnatus dorylas</i> | No common English name known |
| Butterflies | <i>Pontia daplidice</i> | Bath white |
| Butterflies | <i>Pristerognatha penthinana</i> | Balsam marble |
| Butterflies | <i>Pyrausta cingulata</i> | Silver-barred sable |
| Butterflies | <i>Sesia bembeciformis</i> | Lunar hornet moth |
| Butterflies | <i>Sideridis albicolon</i> | White colon |
| Butterflies | <i>Spiris striata</i> | Feathered footman |
| Butterflies | <i>Spuleria flavicaput</i> | Yellow-headed cosmet |
| Butterflies | <i>Synanthedon vespiformis</i> | Yellow-legged clearwing |
| Molluscs | <i>Platyla polita</i> | No common English name known |
| Beetles | <i>Abraeus granulum</i> | No common English name known |
| Beetles | <i>Allecula rhenana</i> | No common English name known |
| Beetles | <i>Amphimallon fallenii</i> | No common English name known |
| Beetles | <i>Anoplodera scutellata</i> | No common English name known |
| Beetles | <i>Aphodius luridus</i> | No common English name known |
| Beetles | <i>Aphodius coenosus</i> | No common English name known |
| Beetles | <i>Aphodius scrofa</i> | No common English name known |
| Beetles | <i>Apion dispar</i> | No common English name known |
| Beetles | <i>Apion laevigatum</i> | No common English name known |
| Beetles | <i>Batrisodes adnexus</i> | No common English name known |
| Beetles | <i>Brachypera dauci</i> | No common English name known |
| Beetles | <i>Carabus intricatus</i> | Blue ground beetle |
| Beetles | <i>Coniocleonus hollbergi</i> | No common English name known |
| Beetles | <i>Copris lunaris</i> | No common English name known |
| Beetles | <i>Cossonus parallelepipedus</i> | No common English name known |
| Beetles | <i>Crepidophorus mutilatus</i> | No common English name known |
| Beetles | <i>Cryptocephalus exiguus</i> | No common English name known |
| Beetles | <i>Dicronychus equisetioides</i> | No common English name known |
| Beetles | <i>Dinothenarus pubescens</i> | No common English name known |
| Beetles | <i>Donacia tomentosa</i> | No common English name known |
| Beetles | <i>Emus hirtus</i> | No common English name known |
| Beetles | <i>Erotides corruscus</i> | No common English name known |
| Beetles | <i>Erotides cosnardi</i> | Cosnard's net-winged beetle |
| Beetles | <i>Eucnemis capucina</i> | No common English name known |
| Beetles | <i>Euplectus bonvouloiri</i> | No common English name known |
| Beetles | <i>Euthiconus conicicollis</i> | No common English name known |
| Beetles | <i>Galeruca interrupta</i> | No common English name known |
| Beetles | <i>Galeruca pomonae</i> | No common English name known |
| Beetles | <i>Globicornis corticalis</i> | No common English name known |
| Beetles | <i>Harpalus griseus</i> | No common English name known |
| Beetles | <i>Harpalus luteicornis</i> | No common English name known |
| Beetles | <i>Harpalus melancholicus</i> | No common English name known |
| Beetles | <i>Hypera dauci</i> | No common English name known |
| Beetles | <i>Hypulus bifasciatus</i> | No common English name known |
| Beetles | <i>Hypocaccua rugiceps</i> | No common English name known |
| Beetles | <i>Ischnomera caerulea</i> | No common English name known |
| Beetles | <i>Margarinotus neglectus</i> | No common English name known |
| Beetles | <i>Mordellistena neuwaldeggiana</i> | No common English name known |
| Beetles | <i>Pediacus depressus</i> | No common English name known |

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|-----------------|-------------------------------------|------------------------------|
| Beetles | <i>Platycis cosnardi</i> | No common English name known |
| Beetles | <i>Platysoma compressum</i> | No common English name known |
| Beetles | <i>Quedius vexans</i> | No common English name known |
| Beetles | <i>Saprinus virescens</i> | No common English name known |
| Beetles | <i>Silusa rubiginosa</i> | No common English name known |
| Beetles | <i>Stereocorynes truncorum</i> | No common English name known |
| Beetles | <i>Strophosoma faber</i> | No common English name known |
| Beetles | <i>Trinodes hirtus</i> | No common English name known |
| Beetles | <i>Xyletinus ater</i> | No common English name known |
| Dragonflies | <i>Agapetus fuscipes</i> | No common English name known |
| Dragonflies | <i>Brachycercus harrisellus</i> | No common English name known |
| Dragonflies | <i>Brachyptera braueri</i> | No common English name known |
| Dragonflies | <i>Eurolon nostras</i> | No common English name known |
| Dragonflies | <i>Wormaldia occipitalis</i> | No common English name known |
| Arachnids | <i>Bromella falcigera</i> | No common English name known |
| Hymenoptera | <i>Andrena batava</i> | No common English name known |
| Hymenoptera | <i>Andrena bimaculata</i> | No common English name known |
| Hymenoptera | <i>Astata minor</i> | No common English name known |
| Hymenoptera | <i>Bombus muscorum</i> | Moss carder bee |
| Hymenoptera | <i>Dufourea halictula</i> | No common English name known |
| Hymenoptera | <i>Lasioglossum brevicorne</i> | Short-horned furrow bee |
| Hymenoptera | <i>Megachile lagopoda</i> | No common English name known |
| Hymenoptera | <i>Panurgus banksianus</i> | No common English name known |
| Hymenoptera | <i>Podalonia luffii</i> | No common English name known |
| Hymenoptera | <i>Sphecodes miniatus</i> | No common English name known |
| Diptera | <i>Asilus crabroniformis</i> | Hornet robberfly |
| Diptera | <i>Choerades ignaeus</i> | No common English name known |
| Diptera | <i>Chrysopilus erythrophthalmus</i> | No common English name known |
| Diptera | <i>Laphria ephippium</i> | No common English name known |
| Diptera | <i>Myolepta dubia</i> | No common English name known |
| Diptera | <i>Oxycera nigricornis</i> | No common English name known |
| Diptera | <i>Paragus constrictus</i> | No common English name known |
| Diptera | <i>Sciapus basilicus</i> | No common English name known |
| Vascular plants | <i>Aira caryophyllea</i> | Silver hair-grass |
| Vascular plants | <i>Alyssum alyssoides</i> | Small Alison |
| Vascular plants | <i>Anthriscus caucalis</i> | Bur chervil |
| Vascular plants | <i>Bromus arvensis</i> | Field brome |
| Vascular plants | <i>Camelina microcarpa</i> | Little-pod false flax |
| Vascular plants | <i>Carex hartmanii</i> | Hartman's sedge |
| Vascular plants | <i>Carex pulicaris</i> | Flea sedge |
| Vascular plants | <i>Catabrosa aquatica</i> | Whorl-grass |
| Vascular plants | <i>Centaurium erythraea</i> | Common centaury |
| Vascular plants | <i>Cuscuta epithimum</i> | Dodder |
| Vascular plants | <i>Drymochloa sylvatica</i> | Wood fescue |
| Vascular plants | <i>Epipactis phyllanthes</i> | Green flowered helleborine |
| Vascular plants | <i>Euphrasia micrantha</i> | No common English name known |
| Vascular plants | <i>Fraxinus excelsior</i> | Ash |
| Vascular plants | <i>Filago vulgaris</i> | Common cudweed |
| Vascular plants | <i>Gymnocarpium robertianum</i> | Limestone fern |

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|-----------------|---|------------------------------|
| Vascular plants | <i>Herminium monorchis</i> | Musk orchid |
| Vascular plants | <i>Holosteum umbellatum</i> | Jagged chickweed |
| Vascular plants | <i>Hypochoeris glabra</i> | Smooth cat's-ear |
| Vascular plants | <i>Lathyrus tuberosus</i> | Earth-nut pea |
| Vascular plants | <i>Leersia oryzoides</i> | Rice cutgrass |
| Vascular plants | <i>Leonurus cardiaca</i> | Motherwort |
| Vascular plants | <i>Lepidium coronopus</i> | Swine cress |
| Vascular plants | <i>Liparis loeselii</i> | Fen orchid |
| Vascular plants | <i>Malva pusilla</i> | Small mallow |
| Vascular plants | <i>Pilularia globulifera</i> | Pillwort |
| Vascular plants | <i>Polygala comosa</i> | No common English name known |
| Vascular plants | <i>Potentilla anglica</i> | Trailing tormentil |
| Vascular plants | <i>Pulsatilla vulgaris</i> | Pasque Flower |
| Vascular plants | <i>Scabiosa canescens</i> | No common English name known |
| Vascular plants | <i>Sparganium erectum ssp. oocarpum</i> | No common English name known |
| Vascular plants | <i>Stellaria neglecta</i> | Greater chickweed |
| Vascular plants | <i>Thymus pulegioides</i> | Broad-leaved thyme |
| Vascular plants | <i>Ulmus glabra</i> | Wych elm |
| Vascular plants | <i>Veronica montana</i> | Wood speedwell |
| Vascular plants | <i>Veronica triphyllos</i> | Three-leaved speedwell |
| Vascular plants | <i>Vicia dumetorum</i> | No common English name known |
| Vascular plants | <i>Vicia villosa</i> | Hairy vetch |
| Fungi | <i>Amanita strobiliformis</i> | Warted amanita |
| Fungi | <i>Camarops tubulina</i> | No common English name known |
| Fungi | <i>Cortinarius alcalinophilus</i> | No common English name known |
| Fungi | <i>Cortinarius croceocaeruleus</i> | No common English name known |
| Fungi | <i>Cortinarius cupreorufus</i> | No common English name known |
| Fungi | <i>Cortinarius humicola</i> | No common English name known |
| Fungi | <i>Cortinarius turgidus</i> | No common English name known |
| Fungi | <i>Cystolepiota adulterina</i> | No common English name known |
| Fungi | <i>Cystolepiota hetieri</i> | No common English name known |
| Fungi | <i>Disciseda candida</i> | No common English name known |
| Fungi | <i>Entoloma tjallingiorum</i> | Hairy pinkgill |
| Fungi | <i>Echinodema pseudoasperulum</i> | No common English name known |
| Fungi | <i>Geastrum minimum</i> | Tiny earthstar |
| Fungi | <i>Geopora cooperi</i> | Fuzzy truffle |
| Fungi | <i>Gymnopus hariolorum</i> | No common English name known |
| Fungi | <i>Hygrocybe intermedia</i> | Fibrous waxcap |
| Fungi | <i>Hymenochaete ulmicola</i> | No common English name known |
| Fungi | <i>Hygrophorus poëtarum</i> | No common English name known |
| Fungi | <i>Inocybe fibrosoides</i> | No common English name known |
| Fungi | <i>Inonotus dryadeus</i> | Oak bracket |
| Fungi | <i>Inonotus hispidus</i> | Shaggy bracket |
| Fungi | <i>Ischnoderma resinosum</i> | No common English name known |
| Fungi | <i>Lactarius decipiens</i> | No common English name known |
| Fungi | <i>Lepiota fuscovinacea</i> | No common English name known |
| Fungi | <i>Lepiota grangei</i> | Green dapperling |
| Fungi | <i>Lepiota ignivolvata</i> | No common English name known |
| Fungi | <i>Lepiota ochraceofulva</i> | No common English name known |

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|-----------|----------------------------------|------------------------------------|
| Fungi | <i>Lepiota tomentella</i> | No common English name known |
| Fungi | <i>Melanogaster tuberiformis</i> | No common English name known |
| Fungi | <i>Melanomphalia nigrescens</i> | No common English name known |
| Fungi | <i>Melanophyllum eyrei</i> | Greenspored dapperling |
| Fungi | <i>Mycenastrum corium</i> | No common English name known |
| Fungi | <i>Pluteus chrysophaeus</i> | Yellow shield |
| Fungi | <i>Ramaria sanguinea</i> | Bloody coral |
| Fungi | <i>Ramaria bataillei</i> | No common English name known |
| Fungi | <i>Ramaria pallida</i> | No common English name known |
| Fungi | <i>Russula incarnata</i> | No common English name known |
| Fungi | <i>Rugosomyces ionides</i> | No common English name known |
| Fungi | <i>Russula melliolens</i> | No common English name known |
| Fungi | <i>Pycnoporellus fulgens</i> | No common English name known |
| Fungi | <i>Skeletocutis lenis</i> | No common English name known |
| Fungi | <i>Squamanita contortipes</i> | Contorted Strangler |
| Fungi | <i>Tyromyces wynnei</i> | No common English name known |
| Stonewort | <i>Nitellopsis obtusa</i> | Starry stonewort |
| Lichens | <i>Arthonia pruinata</i> | No common English name known |
| Lichens | <i>Bacidia friesiana</i> | No common English name known |
| Lichens | <i>Bacidia incompta</i> | No common English name known |
| Lichens | <i>Bacidia polychroa</i> | Polychrome dot lichen |
| Lichens | <i>Bacidina delicata</i> | No common English name known |
| Lichens | <i>Bactrospora corticola</i> | No common English name known |
| Lichens | <i>Caloplaca ulcerosa</i> | No common English name known |
| Lichens | <i>Fellhaneropsis vezdae</i> | No common English name known |
| Lichens | <i>Lecanographa amylacea</i> | No common English name known |
| Lichens | <i>Hypotrachyna revoluta</i> | Powdered loop lichen |
| Lichens | <i>Melanelia elegantula</i> | Elegant camouflage lichen |
| Lichens | <i>Megalaria grossa</i> | Very large dot lichen |
| Lichens | <i>Opegrapha vermicellifera</i> | No common English name known |
| Lichens | <i>Pertusaria multipuncta</i> | No common English name known |
| Lichens | <i>Physconia grisea</i> | No common English name known |
| Lichens | <i>Sphinctrina turbinata</i> | Short-stalk parasite needle lichen |
| Mosses | <i>Eurhynchium schleicheri</i> | Twist-tip feather moss |
| Mosses | <i>Oxyrrhynchium speciosum</i> | Showy feather moss |

409 species have been listed to date under the category Near Threatened (NT) in accordance with ArtDatabanken 2010, compared with 360 in accordance with the list in the application.

(6) Updated list of main bibliographic references (to be annexed)

[Provide a list of the main publications and articles of relevance to the proposed biosphere reserve.]

Scientific articles relating to Kristianstads Vattenrike Biosphere Reserve

EUROPARC Nordic-Baltic Section, Christina Andersson, 2011. *Ecosystem Services in Protected Area Management Report from the EUROPARC Nordic-Baltic Section Seminar* May 3–5, 2011 Kristianstads Vattenrike Biosphere Reserve*, Kristianstad, Sweden

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Vattenriket in focus (Vattenriket i fokus)

Vattenriket in focus is a written series produced by Kristianstads Vattenrike Biosphere Reserve (ISSN 1653-9338). Reports and inventories are published in Vattenriket in focus that have been undertaken at the request of, or in cooperation with the Biosphere Office. The written series was commenced in 2006.

2006:01 Hammarsjöns häckande fåglar. Inventering 2006 och utveckling sedan 1956, Olofsson Patrik.

2007:01 Biosfärområde Kristianstads Vattenrike. Verksamheten 2006, Biosfärkontoret.

2007:02 Flyginventering av grågås i Hammarsjön och Araslövssjön samt delar av Oppmannasjön och Ivösjön, Olofsson Patrik.

2007:03 Inventering av solitära bin väster om Åhus på Ripa sandar, Horna sandar och Sannarna inom Biosfärområde Kristianstads Vattenrike sommaren 2006, Sörensson Mikael.

2007:04 Uppföljning av settlingbottnar för flodpärlmusslan i Vramsån. Undersökningar år 2006 fisk och glochidielarver, Ekologgruppen.

2007:05 Handlingsprogram 2007-2009, Biosfärkontoret.

2008:01 Vattenriket en utflyktsguide. Patrik Olofsson och Karin Magntorn.

2008:02 Inventering av fältpiplärka på Ripa sandar, Horna sandar samt Sannarna 2007, Olofsson Patrik.

2008:03 Inventering av fågelfaunan på Åsumfältet.

A3:s före detta. militära övningsfält i N Åsum, Olofsson Patrik.

2008:04 Inventering av solitära bin och rödlistade insekter på Åsumfältet och vid före detta järnvägsövergången Everöd/Lyngby sommaren 2007, Sörensson Mikael.

2008:05 Inventering av buksvampar inom Biosfärområde Kristianstads Vattenrike, hösten och vintern 2006/2007, Ramlösa Naturkonsult, Hansson Sven-Åke Hanson.

2008:06 Invallningar kring de nedre delarna av Helge å. Grunddata, våtmarkspotential och framtid, Berglund P.

2008:07 Utvärdering av provfiske i Araslövssjön och Hammarsjön 2007, Olsson Ivan. Eklöv Anders.

2008:08 Biosfärområde Kristianstads Vattenrike. Verksamheten 2007, Biosfärkontoret.

2008:09 Flyginventering av grågås i Hammarsjön och Araslövssjön mm, Olofsson Patrik.

2009:01 Biosfärområde Kristianstads Vattenrike. Verksamheten 2008, Biosfärkontoret.

2009:02 Ekosystemtjänstanlys i Kristianstads Vattenrike Pilotstudie strandängar, M. Nekoro och J. Svedén.

2009:03 Vägvisning till Vattenrikets besöksmål. Författare Ebba Trolle.

2009:04 Kulturhistorisk analys av Kristianstads Golfklubbs golfbanor i Åhus. Författare Liselott Wernersson.

2009:05 Markhävdkartering 2008 hävd tillståndet på betesmarker och slätterängar inom nedre Helgeåns våtmarksområde i Kristianstads Vattenrike. Pyret Oveson juli 2009.

2009:06 Åsumfältets natur- och kulturvärden belysta genom dess historia. Nils-Otto Nilsson.

2009:07 Landskapsplan för ripa och Horna sandar. Merit Kindström.

- 2009:08 Ekosystemtjänster - ett verktyg för hållbar utveckling. Rapport från konferens i Kristianstad juni 2009.
- 2010:01 Biosfärområde Kristianstads Vattenrike. Verksamheten 2009, Biosfärkontoret.
- 2010:02 Rör om i sanden! Allmänna råd för bevarande av sandmarkernas växter och djur. Ebba Trolle.
- 2010:03 Solitärbin och andra insekter på Kristianstads Golfklubbs golfbanor i Åhus- inventering och förslag på riktade skötselåtgärder. Mikael Sörensson.
- 2010:04 Handlingsprogram för Biosfärområde Kristianstads Vattenriket 2010-2013. Viktigt i Vattenriket. Biosfärkontoret.
- 2010:05 Naturum Vattenriket – mitt i Kristianstad, mitt i Vattenriket. Biosfärkontoret. Finns till försäljning på naturum Vattenriket.
- 2010:06 Ålens fortlevnad- Rapport från seminariet ÅL 2010 i Åhus. Biosfärkontoret och Ålakademin.
- 2010:07 Inventering av döda och döende klibbalbestånd. Christer Olsson.
- 2010:08 Vedinsekter i uddarp - inventering sommaren 2009. Gunnar Isacson.
- 2011:01 Biosfärområde Kristianstads Vattenrike. Verksamheten 2010, Biosfärkontoret.
- 2011:02 Provfiske i Hammarsjön och Araslövssjön 2010. Jonas Dahl, Biosfärkontoret.
- 2011:03 Provfiske i Råbelövssjön 2010. Jonas Dahl, Biosfärkontoret.
- 2012:01 Biosfärområde Kristianstads Vattenrike. Verksamheten 2011, Biosfärkontoret.
- 2012:02 Mer än en golfbana - ta tillvara banans natur- och kulturvärden. Patrik Olofsson, Biosfärkontoret.
- 2012:03 Upplev naturen i Skåne starta på naturum och naturcentrum. Åsa Pearce, Biosfärkontoret. (12 MB)
- 2012:04 Underlag för utveckling och styrning av det båtburna friluftslivet på Helge å. Andreas Nilsson, Biosfärkontoret.
- 2012:05 Provfiske efter mal i Nedre Helgeån 2011. Jonas Dahl, Biosfärkontoret.
- 2012:06 Ålens framtid - att bruka eller förbruka ekosystemtjänster. 20 röster om ålen. Per Erik Tell på uppdrag av Biosfärkontoret.
- 2012:07 Flyginventering av grågås i Hammarsjön och Araslövssjön samt delar av Oppmannasjön och Ivösjön. Patrik Olofsson Eco Images på uppdrag av Biosfärkontoret.
- 2013:01 Biosfärområde Kristianstads Vattenrike. Verksamheten 2012, Biosfärkontoret.
- 2013:02 Provfiske efter mal i Nedre Helgeån 2012. Jonas Dahl, Biosfärkontoret.
- 2013:03 Ålens fortlevnad och rent vatten- Rapport från seminariet ÅL 2013 23-24 januari. Biosfärkontoret och Ålakademin.
- 2013:04 Stortapetsarbetet - inventering 2010–2012. Ulf Lundwall och Göran Holmström.
- 2013:05 Bristande födotillgång och torrare vårar på strandängarna i Kristianstads Vattenrike: -möjliga orsaker till vadarnas tillbakagång? Gunnar Gunnarsson, Rebecca Hessel och Richard Ottvall.
- 2013:06 Åsumfältet - Nyehusen Inventering av solitära bin och andra insekter 2012 - med sköselförslag. Krister Larsson, ALLMA Natur och Kultur.
- 2013:07 Inventering av vildbin vid Horna och Trafikplats Vä 2012 med fokus på miljövård- med sköselförslag. L. Anders Nilsson, EkoBi Natur.
- 2013:08 Sammanställning av elfisken i Vattenriket. Nils Möllerström, praktikant.
- 2014:01 Biosfärområde Kristianstads Vattenrike. Verksamheten 2013, Biosfärkontoret.
- 2014:02 Strandängsfåglar i Vattenriket - Häckfågelkarteringar och simultanräkningar, Hans Cronert.
- 2014:03 Naturvärdesinventering av Åsums fure. Nils-Otto Nilsson, Ekoscandica Naturguide AB. (8 MB)
- 2014:04 Sandmarker vid Åhus - Rödlistade arter och uppföljning av insekter 2012-13. Krister Larsson (16,5 MB)
- 2014:05 Provfiske efter mal i Nedre Helgeån 2013. Jonas Dahl, Biosfärkontoret. (1.2 MB)
- 2014:06 Flyginventering av grågås i Hammarsjön och Araslövssjön samt delar av Oppmannasjön och Ivösjön. Patrik Olofsson Eco Images på uppdrag av Biosfärenheten. (3 MB)
- 2014:07 Bland sjögräs och tång i Hanöbukten. Lena Svensson, Biosfärenheten. (2,5 MB)
- 2015:01 Biosfärområde Kristianstads Vattenrike. Verksamheten 2014, Biosfärenheten.
- 2015:02 Provfiske i Helgeåns avrinningsssystem -2014, Håkan Östberg, Biosfärenheten.

(7) Other supporting documents

No other supporting documents at present.

10. ADDRESSES

10.1 Contact address of the proposed biosphere reserve:

[Government agency, organization, or other entity (entities) to serve as the main contact to whom all correspondence within the World Network of Biosphere Reserves should be addressed.]

Name: Kristianstads Vattenrike Biosphere Reserve
 Street or P.O. Box Biosfärenheten, Kommunledningskontoret, Kristianstads kommun
 City with postal code SE-291 80 Kristianstad
 Country: Sweden
 Telephone: +46-(0)44-136480, +46(0)44-136486
 E-mail: carina.wettemark@kristianstad.se
 Web site: www.vattenriket.kristianstad.se

20.2. and 20.3 Administering entity of the core area(s) and the buffer zone(s):

The administrative responsibility for the core area and buffer zones is primarily divided between the various authorities and other stakeholders indicated below. The Biosphere Office handles all correspondence relating to this area under the biosphere activities before subsequently communicating these matters to the respective authority/stakeholder concerned.

Swedish Environmental Protection Agency – www.naturvardsverket.se

County Administrative Board of Skåne – www.lansstyrelsen.se/skane

Swedish Forest Agency – www.skogsstyrelsen.se

Kristianstad Municipality – www.kristianstad.se

20.4. Administering entity of the transition area(s):

Name: Kristianstads Vattenrike Biosphere Reserve
 Street or P.O. Box Biosfärenheten, Kommunledningskontoret, Kristianstads kommun
 City with postal code SE-291 80 Kristianstad
 Country: Sweden
 Telephone: +46-(0)44-136480, +46(0)44-136486
 E-mail: carina.wettemark@kristianstad.se
 Web site: www.vattenriket.kristianstad.se

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|--|
| Annex I to the Biosphere Reserve Periodic Review MABnet Directory of Biosphere Reserves |
|--|

Administrative details**Country:** Sweden**Name of BR:** Kristianstads Vattenrike Biosphere Reserve**Year designated:** 2005**Administrative authorities:** Kristianstad Municipality**Name contact:** Carina Wettemark Manager, Biosphere Office/Coordinator, Kristianstads Vattenrike Biosphere Reserve**Contact address:** Biosfärenheten, Kommunledningskontoret, Kristianstads kommun
291 80 Kristianstad, Sweden

+46-(0)44-136480, +46(0)44-136486

carina.wettemark@kristianstad.se

Related links: www.vattenriket.kristianstad.se**Social networks:** (6.5.4)**Description**

General description:

The biosphere reserve is situated in the north-eastern part of Scania which is Sweden's most southerly landscape. The landscape of the area is very varied and contains a mosaic of forests, low mountain ridges, lakes, watercourses, wetlands and flat agricultural land. A marine area along the coast of Hanöbukten of the Baltic Sea to the east is included. The landscape of the central areas, where the City of Kristianstad is situated, is dominated by a flat agricultural landscape stretching all the way down to the coast. The forested areas are primarily situated in the western and northern parts of the reserve that are mainly located above the highest coastline (55 m above sea level).

Special conditions relating to morphology, climate, geology, hydrology and cultural history contribute in various ways to the area's rich variation in valuable nature types and species.

The River Helge å with its lakes and wetlands are of international importance (*River Helge å Ramsar Convention Site*) and drain centrally through Kristianstads Vattenrike Biosphere Reserve. Other nature types with particularly high natural values are ancient broadleefforests, sandy grasslands with a long tradition of a rotation system of cultivation and fallow, eelgrass beds in Hanöbukten Bay and sand dune areas along the coast. There are 34 areas in the biosphere reserve that are included in the EU's Natura 2000 network, 30 nature reserves and two IBA areas (Important Bird Areas).

The considerable number of red-listed species provides confirmation of the large biodiversity of the biosphere reserve and the need to work in a targeted manner in connection with conservation work

in the entire landscape. The reserve forms one of the main areas in Sweden in terms of species richness and the presence of threatened species. In February 2015, 775 red-listed species were registered in the biosphere reserve, of which 366 are threatened (CN, EN and VU). Several of these species have a particularly high conservation value owing to the fact that their main distribution is located within the biosphere reserve.

Major ecosystem type: Running water, lakes, grazing land, hay meadows, deciduous forest, coniferous forest, sand dunes, marine ecosystems.

Major habitats & land cover types: Forest, agricultural land, natural grazing land, freshwater, ocean, urban areas.

Bioclimatic zone: Warm temperate climate according to the Köppen climate classification.

Location (latitude and longitude): 56°01'57''N, 14°08'58''E

Total area 104,375 ha

Core area: 7,179 ha

Buffer zones: 22,900 ha

Transition area: 74,297 ha

Different existing zonation: Temperate and subpolar broadleaf forests or woodlands (UNESCO def.). According to Udvardy's classification system, the biosphere reserve belongs to the landscape type Middle European forest characterised by deciduous forest. The area belongs to the continental region based on the EU classification system.

Altitudinal range 2.32 metres below sea level – 190 metres above sea level (RH2000)

Zonation maps (see section 2.2.2):

Main objectives of the biosphere reserve

Brief description

To work towards sustainable development benefiting both man and nature in the Kristianstads Vattenrike biosphere Reserve and Kristianstad Municipality.

To perform targeted conservation work relating to valuable natural environments and species with both nature and man as the focus.

To continuously develop knowledge regarding natural and cultural values, and the requirements for protection and management concerning valuable nature types and species.

To work in cooperation and dialog with a multi-stakeholder approach and with the goal of creating trust and to change attitudes.

To raise awareness of the importance of a long-term sustainable future by inspiring people of all ages to have a pleasurable and respectful relation towards nature.

To make it easier for the public, pupils and researchers to benefit from all of the values of the biosphere reserve through the visitor centre, visitor sites, website, social media and information material.

Research

Brief description

Examples of research and environmental monitoring that have been performed and which will be further developed:

Knowledge-enhancing inventories of biodiversity relating to freshwater, marine and sandy areas.

Reasons behind the decline in populations of breeding wading birds on the wet grasslands of the biosphere reserve.

Research and environmental monitoring of the brownification of freshwater in lakes and watercourses.

A pilot study of ecosystem services and resilience linked to the wet grassland environments.

Tourism economic research based on a visitor perspective.

Monitoring

Brief description

Monitoring the conditions of aquatic and terrestrial environments is performed within the biosphere reserve by various stakeholders and with varying aims. Some examples include:

The continuous monitoring of limnic environments through survey fishing and water chemistry sampling.

Annual inventories of breeding and resting birds, primarily waders, geese and cranes.

Monitoring through targeted and comprehensive inventories of threatened vascular plants.

Evaluation of restoring and other actions in sandy areas through inventories of invertebrates and vascular plants.

Ongoing documentation of visitor frequency for the activities of the Naturum Vattenriket visitor centre and at the visitor sites in the biosphere reserve.

Specific variables (fill in the table below and tick the relevant parameters)

| Abiotic | | Biodiversity | |
|-------------------------------|---|------------------------------------|---|
| Abiotic factors | x | Afforestation/Reforestation | x |
| Acidic deposition/Atmospheric | | Algae | x |
| Air quality | x | Alien and/or invasive species | |
| Air temperature | x | Amphibians | x |
| Climate, climatology | x | Arid and semi-arid systems | |
| Contaminants | x | Autoecology | |
| Drought | | Beach/soft bottom systems | x |
| Erosion | x | Benthos | x |
| Geology | x | Biodiversity aspects | x |
| Geomorphology | x | Biogeography | |
| Geophysics | | Biology | x |
| Glaciology | | Biotechnology | x |
| Global change | | Birds | x |
| Groundwater | x | Boreal forest systems | x |
| Habitat issues | x | Breeding | |
| Heavy metals | x | Coastal/marine systems | x |
| Hydrology | x | Community studies | x |
| Indicators | x | Conservation | x |
| Meteorology | x | Coral reefs | |
| Modelling | x | Degraded areas (e.g. erosion) | |
| Monitoring/methodologies | | Desertification | |
| Nutrients | x | Dune systems | x |
| Physical oceanography | | Ecology | x |
| Pollution, pollutants | x | Ecosystem assessment | x |
| Siltation/sedimentation | | Ecosystem functioning/structure | x |
| Soil | | Ecosystem services | x |
| Speleology | | Ecotones | x |
| Topography | | Endemic species | x |
| Toxicology | | Ethology | x |
| UV radiation | | Evapotranspiration | |
| | | Evolutionary studies/palaeoecology | |
| | | Fauna | x |
| | | Fires/fire ecology | x |
| | | Fishes | x |
| | | Flora | x |
| | | Forest systems | x |
| | | Freshwater systems | x |
| | | Fungi | x |
| | | Genetic resources | |
| | | Genetically modified organisms | |
| | | Home gardens | |
| | | Indicators | x |
| | | Invertebrates | x |
| | | Island systems/studies | |
| | | Lagoon systems | |
| | | Lichens | x |
| | | Mammals | x |
| | | Mangrove systems | |
| | | Mediterranean type systems | |

| | | | |
|--|--|---|---|
| | | Microorganisms | x |
| | | Migrating populations | x |
| | | Modelling | x |
| | | Monitoring/methodologies | x |
| | | Mountain and highland systems | |
| | | Natural and other resources | |
| | | Natural medicinal products | |
| | | Perturbations and resilience | x |
| | | Pests/Diseases | |
| | | Phenology | x |
| | | Phytosociology/Succession | |
| | | Plankton | x |
| | | Plants | x |
| | | Polar systems | |
| | | Pollination | x |
| | | Population genetics/dynamics | x |
| | | Productivity | |
| | | Rare/Endangered species | x |
| | | Reptiles | x |
| | | Restoration/Rehabilitation | x |
| | | Species (re) introduction | x |
| | | Species inventorying | x |
| | | Sub-tropical and temperate rainforest | |
| | | Taxonomy | |
| | | Temperate forest systems | |
| | | Temperate grassland systems | |
| | | Tropical dry forest systems | |
| | | Tropical grassland and savannah systems | |
| | | Tropical humid forest systems | |
| | | Tundra systems | |
| | | Vegetation studies | |
| | | Volcanic/Geothermal systems | |
| | | Wetland systems | x |
| | | Wildlife | x |

| | | Integrated monitoring | |
|---|---|-------------------------------------|---|
| Agriculture/Other production systems | x | Biogeochemical studies | |
| Agroforestry | | Carrying capacity | |
| Anthropological studies | | Climate change | x |
| Aquaculture | | Conflict analysis/resolution | |
| Archaeology | x | Ecosystem approach | x |
| Bioprospecting | | Education and public awareness | x |
| Capacity building | x | Environmental changes | x |
| Cottage (home-based) industry | | Geographic Information System (GIS) | x |
| Cultural aspects | x | Impact and risk studies | x |
| Demography | x | Indicators | |
| Economic studies | | Indicators of environmental quality | x |
| Economically important species | | Infrastructure development | |
| Energy production systems | | Institutional and legal aspects | |
| Ethnology/traditional practices/knowledge | | Integrated studies | |
| Firewood cutting | | Interdisciplinary studies | x |
| Fisheries | x | Land tenure | |
| Forestry | x | Land use/Land cover | |
| Human health | x | Landscape inventorying/monitoring | x |
| Human migration | x | Management issues | x |
| Hunting | | Mapping | x |
| Indicators | | Modelling | x |
| Indicators of sustainability | | Monitoring/methodologies | x |
| Indigenous people's issues | | Planning and zoning measures | |
| Industry | | Policy issues | |
| Livelihood measures | | Remote sensing | |
| Livestock and related impacts | | Rural systems | |
| Local participation | | Sustainable development/use | |
| Micro-credits | | Transboundary issues/measures | |
| Mining | | Urban systems | |
| Modelling | | Watershed studies/monitoring | x |
| Monitoring/methodologies | x | | |
| Natural hazards | | | |
| Non-timber forest products | | | |
| Pastoralism | | | |
| People-Nature relations | x | | |
| Poverty | | | |
| Quality economies/marketing | | | |
| Recreation | x | | |
| Resource use | | | |
| Role of women | | | |
| Sacred sites | | | |
| Small business initiatives | | | |
| Social/Socio-economic aspects | | | |
| Stakeholders' interests | | | |
| Tourism | x | | |
| Transport | | | |

Annex II to the Biosphere Reserve Periodic Review

Promotion and Communication Materials for the biosphere reserve

Provide some promotional material regarding the site, notably high quality photos, and/or short videos on the site so as to allow the Secretariat to prepare appropriate files for press events. To this end, a selection of photographs in high resolution (300 dpi), with photo credits and captions and video footage (rushes), without any comments or sub-titles, of professional quality – DV CAM or BETA only, will be needed.

High-resolution images may be downloaded from the website www.vattenriket.kristianstad.se/unesco/. The website also contains links to films on Kristianstads Vattenrike Biosphere Reserve in the format we have access to.



Kristianstad and the urban wetlands with the Naturum Vattenriket visitor centre. Photograph: Patrik Olofsson/N.



Wet grasslands on the Isterinäset nature reserve with Kristianstad in the background. Photograph: Patrik Olofsson/N.



Naturum Vattenriket is the biosphere reserve visitor centre located in the heart of Kristianstad and in the heart of the wetlands. Photograph: Karin Magtorn.



Multifunctional golf course outside Åhus. Photograph: Patrik Olofsson/N.



Feeling great in Vattenriket! Photograph: Karin Magtorn.



Sandy grasslands. Photograph: Sven-Erik Magnusson.



Educating biosphere ambassadors. Photograph: Åsa Pearce.



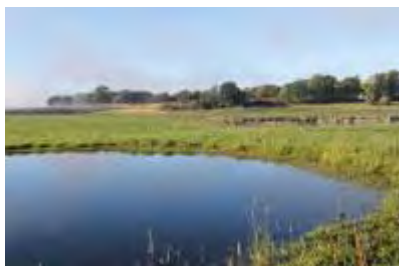
Young European catfish Photograph: Sven-Erik Magnusson.



Children at the biosphere camp. Photograph: Josefin Svensson.



Crane feeding at the Pulken Outdoor Museum. Photograph: Sussie Söderlundh.



Newly created wetland in the River Helge å catchment area. Photograph: Sven-Erik Magnusson.

Films

Vattenriket - a short film

Language: No dialogue

Film-maker: Patrik Olofsson/N.



Kristianstads Vattenrike Biosphere Reserve - for the benefit of man and nature

This film presents some examples from Vattenriket of how various stakeholders cooperate in order to find solutions to provide benefits in multiple ways. For example, how farmers, civil servants and non-profit organisations with an interest in birds work together in connection with cranes, and how a golf course can be useful in multiple ways.

Language: Swedish, English and German

Film-maker: Patrik Olofsson/N





UNESCO Photo Library

Bureau of Public Information

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2. I certify that:
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 - b) The photo(s) is/are in no way whatever a violation or an infringement of any existing copyright or licence, and contain(s) nothing obscene, libellous or defamatory.

Name and Address:

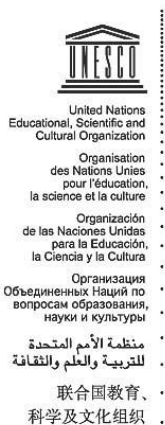
Signature :

Date :

(Sign, return to UNESCO two copies of the Agreement and retain the original for yourself)

Mailing address: 7 Place Fontenoy, 75352 Paris 07 SP, Direct Telephone: 00331 – 45681687

Direct Fax: 00331 – 45685655; e-mail: photobank@unesco.org; m.ravassard@unesco.org



UNESCO Photo Library

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Reference:

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 - b) These rights are granted to UNESCO for the legal term of copyright throughout the world.
 - c) The name of the author/copyright holder will be cited alongside UNESCO's whenever his/her work is used in any form.
2. I certify that:
 - a) I am the sole copyright holder of the video(s) and am the owner of the rights granted by virtue of this agreement and other rights conferred to me by national legislation and pertinent international conventions on copyright and that I have full rights to enter into this agreement.
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Direct Fax: 00331 – 45685655; e-mail: photobank@unesco.org; m.ravassard@unesco.org

Annex III to the Biosphere Reserve Periodic Review

The Statutory Framework of the World Network of Biosphere Reserves

Introduction

Within UNESCO's Man and the Biosphere (MAB) programme, biosphere reserves are established to promote and demonstrate a balanced relationship between humans and the biosphere. Biosphere reserves are designated by the International Co-ordinating Council of the MAB Programme, at the request of the State concerned. Biosphere reserves, each of which remains under the sole sovereignty of the State where it is situated and thereby submitted to State legislation only, form a World Network in which participation by the States is voluntary.

The present Statutory Framework of the World Network of Biosphere Reserves has been formulated with the objectives of enhancing the effectiveness of individual biosphere reserves and strengthening common understanding, communication and co-operation at regional and international levels.

This Statutory Framework is intended to contribute to the widespread recognition of biosphere reserves and to encourage and promote good working examples. The delisting procedure foreseen should be considered as an exception to this basically positive approach, and should be applied only after careful examination, paying due respect to the cultural and socio-economic situation of the country, and after consulting the government concerned.

The text provides for the designation, support and promotion of biosphere reserves, while taking account of the diversity of national and local situations. States are encouraged to elaborate and implement national criteria for biosphere reserves which take into account the special conditions of the State concerned.

Article 1 - Definition

Biosphere reserves are areas of terrestrial and coastal/marine ecosystems or a combination thereof, which are internationally recognized within the framework of UNESCO's programme on Man and the Biosphere (MAB), in accordance with the present Statutory Framework.

Article 2 - World Network of Biosphere Reserves

1. Biosphere reserves form a worldwide network, known as the World Network of Biosphere Reserves, hereafter called the Network.
2. The Network constitutes a tool for the conservation of biological diversity and the sustainable use of its components, thus contributing to the objectives of the Convention on Biological Diversity and other pertinent conventions and instruments.
3. Individual biosphere reserves remain under the sovereign jurisdiction of the States where they are situated. Under the present Statutory Framework, States take the measures which they deem necessary according to their national legislation.

Article 3 - Functions

In combining the three functions below, biosphere reserves should strive to be sites of excellence to explore and demonstrate approaches to conservation and sustainable development on a regional scale:

- (i) conservation - contribute to the conservation of landscapes, ecosystems, species and genetic variation;
- (ii) development - foster economic and human development which is socio-culturally and ecologically sustainable;
- (iii) logistic support - support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development.

Article 4 - Criteria

General criteria for an area to be qualified for designation as a biosphere reserve:

1. It should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions.
2. It should be of significance for biological diversity conservation.
3. It should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale.
4. It should have an appropriate size to serve the three functions of biosphere reserves, as set out in Article 3.
5. It should include these functions, through appropriate zonation, recognizing:
 - (a) a legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives;
 - (b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place;
 - (c) an outer transition area where sustainable resource management practices are promoted and developed.
6. Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and carrying out the functions of a biosphere reserve.
7. In addition, provisions should be made for:
 - (a) mechanisms to manage human use and activities in the buffer zone or zones;
 - (b) a management policy or plan for the area as a biosphere reserve;
 - (c) a designated authority or mechanism to implement this policy or plan;
 - (d) programmes for research, monitoring, education and training.

Article 5 - Designation procedure

1. Biosphere reserves are designated for inclusion in the Network by the International Co-ordinating Council (ICC) of the MAB programme in accordance with the following procedure:

(a) States, through National MAB Committees where appropriate, forward nominations with supporting documentation to the secretariat after having reviewed potential sites, taking into account the criteria as defined in Article 4;

(b) the secretariat verifies the content and supporting documentation: in the case of incomplete nomination, the secretariat requests the missing information from the nominating State;

(c) nominations will be considered by the Advisory Committee for Biosphere Reserves for recommendation to ICC;

(d) ICC of the MAB programme takes a decision on nominations for designation. The Director-General of UNESCO notifies the State concerned of the decision of ICC.

2. States are encouraged to examine and improve the adequacy of any existing biosphere reserve, and to propose extension as appropriate, to enable it to function fully within the Network. Proposals for extension follow the same procedure as described above for new designations.

3. Biosphere reserves which have been designated before the adoption of the present Statutory Framework are considered to be already part of the Network. The provisions of the Statutory Framework therefore apply to them.

Article 6 - Publicity

1. The designation of an area as a biosphere reserve should be given appropriate publicity by the State and authorities concerned, including commemorative plaques and dissemination of information material.

2. Biosphere reserves within the Network, as well as the objectives, should be given appropriate and continuing promotion.

Article 7 - Participation in the Network

1. States participate in or facilitate co-operative activities of the Network, including scientific research and monitoring, at the global, regional and sub-regional levels.

2. The appropriate authorities should make available the results of research, associated publications and other data, taking into account intellectual property rights, in order to ensure the proper functioning of the Network and maximize the benefits from information exchanges.

3. States and appropriate authorities should promote environmental education and training, as well as the development of human resources, in co-operation with other biosphere reserves in the Network.

Article 8 - Regional and thematic subnetworks

States should encourage the constitution and co-operative operation of regional and/or thematic subnetworks of biosphere reserves, and promote development of information exchanges, including electronic information, within the framework of these subnetworks.

Article 9 - Periodic review

1. The status of each biosphere reserve should be subject to a periodic review every ten years, based on a report prepared by the concerned authority, on the basis of the criteria of Article 4, and forwarded to the secretariat by the State concerned.
2. The report will be considered by the Advisory Committee for Biosphere Reserves for recommendation to ICC.
3. ICC will examine the periodic reports from States concerned.
4. If ICC considers that the status or management of the biosphere reserve is satisfactory, or has improved since designation or the last review, this will be formally recognized by ICC.
5. If ICC considers that the biosphere reserve no longer satisfies the criteria contained in Article 4, it may recommend that the State concerned take measures to ensure conformity with the provisions of Article 4, taking into account the cultural and socio-economic context of the State concerned. ICC indicates to the secretariat actions that it should take to assist the State concerned in the implementation of such measures.
6. Should ICC find that the biosphere reserve in question still does not satisfy the criteria contained in Article 4, within a reasonable period, the area will no longer be referred to as a biosphere reserve which is part of the Network.
7. The Director-General of UNESCO notifies the State concerned of the decision of ICC.
8. Should a State wish to remove a biosphere reserve under its jurisdiction from the Network, it notifies the secretariat. This notification shall be transmitted to ICC for information. The area will then no longer be referred to as a biosphere reserve which is part of the Network.

Article 10 - Secretariat

1. UNESCO shall act as the secretariat of the Network and be responsible for its functioning and promotion. The secretariat shall facilitate communication and interaction among individual biosphere reserves and among experts. UNESCO shall also develop and maintain a worldwide accessible information system on biosphere reserves, to be linked to other relevant initiatives.
2. In order to reinforce individual biosphere reserves and the functioning of the Network and sub-networks, UNESCO shall seek financial support from bilateral and multilateral sources.
3. The list of biosphere reserves forming part of the Network, their objectives and descriptive details, shall be updated, published and distributed by the secretariat periodically.

