



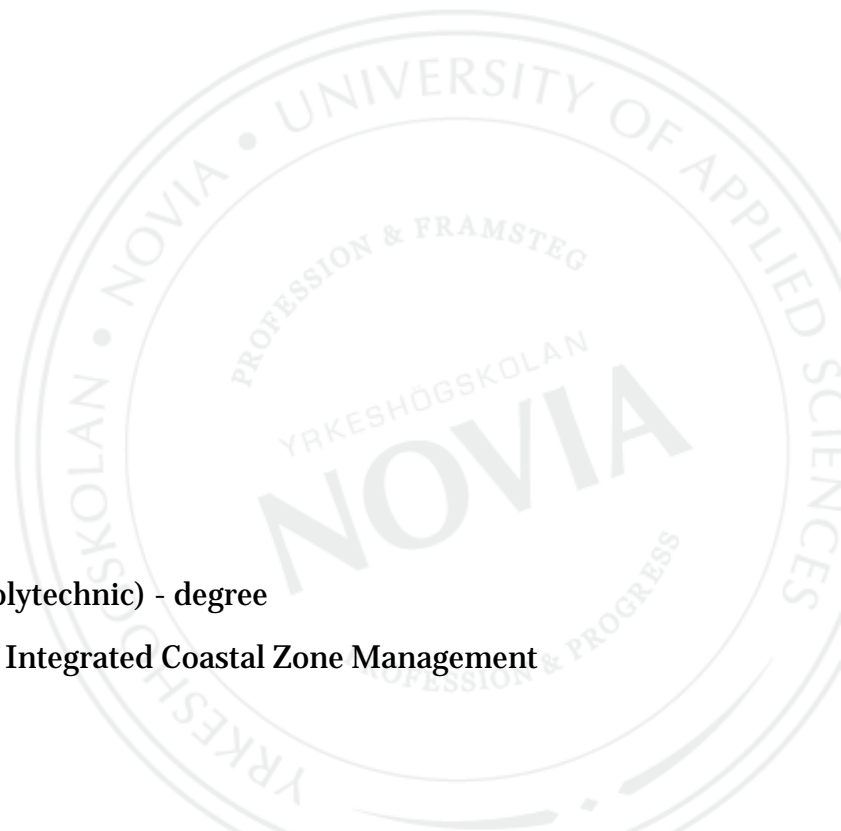
Development Proposition for the Environmental Plan for Oy Nordgolf Ab

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BACHELOR'S THESIS

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Summary

Incorporating environmental issues into company management not only eases the environmental pressure but also gives companies a positive image. The golf industry has the potential of being a forerunner of sustainability.

The thesis was done as commissioned work for Oy Nordgolf Ab. It is a part of the company's application process for a GEO certified ecolabel.

The aim of the thesis is to give a development proposition on the existing environmental plan with the focus being on energy use, product and supply chains, recycling as well as waste and environmental management.

During the summer of 2011 I worked at Oy Nordgolf Ab and gathered data for the proposition. The proposition was based on the information gained from Oy Nordgolf Ab using the GEO checklist as a minimum requirement. The proposition was compiled during spring 2012.

The proposition includes literature based information and practical implementation suggestions.

If the proposition is implemented it would enhance the sustainability of Oy Nordgolf Ab.

Language: English

Key words: environmental plan, golf industry

EXAMENSARBETE

Författare: Mia Wigren

Utbildningsprogram och ort: Integrated Coastal Zone Management

Handledare: Anna Granberg

Titel: Utvecklingsförslag till Oy Nordgolf Ab:s miljöplan

Datum 4.5.2012

Sidantal 30

Bilagor 1

Sammanfattning

Innefattande av miljöärenden i företagets förvaltning minskar inte bara på miljöpressen utan ger också en positiv bild av företaget. Golfbranschen har potential att vara föregångare i hållbar utveckling.

Examensarbetet är ett beställningsarbete för Oy Nordgolf Ab. Arbetet ingår i företagets GEO certifieringsprocess.

Syftet med arbetet är att producera ett utvecklingsförslag av den existerande miljöplanen med fokus på energianvändningen, produkt- och transportkedjor, återvinning och miljöledning.

Under sommaren 2011 jobbade jag på Oy Nordgolf Ab och samlade uppgifter för utvecklingsförslaget. Utvecklingsförslaget baseras på informationen samlad från Oy Nordgolf Ab och GEO checklistan fungerade som minimikrav.

Utvecklingsförslaget sammanställdes våren 2011. I utvecklingsförslaget finns litteraturbaserad information och praktiska förslag på förbättringar.

Om förslaget genomförs skulle den hållbara utvecklingen förbättras i Oy Nordgolf Ab.

Språk: Engelska

Nyckelord: Miljöplan, golfbransch

OPINNÄYTETYÖ

Tekijä: Mia Wigren

Koulutusohjelma ja paikkakunta: Integrated Coastal Zone Management

Ohjaajat: Anna Granberg

Nimike: Kehitysehdotus Oy Nordgolf Ab:n ympäristösuunnitelmaan

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Liitteet 1

Tiivistelmä

Ympäristökysymysten sisällyttäminen yhtiön hallintoon ei ainoastaan helpota ympäristöön kohdistuvaa painetta vaan myös parantaa yhtiön imagoa. Golf alalla on edellytykset toimia edelläkävijänä kestäväen kehityksen saralla. Tämä opinnäytetyö tehdään Oy Nordgolf Ab:n toimeksiannosta. Työ toimii osana yhtiön GEO-sertifiointiprosessia.

Työn tavoitteena on tehdä kehitysehdotus olemassa olevalle ympäristöohjelmalle. Ehdotuksen keskeiset aiheet ovat energiansäästö, hankinnat, kierrätys sekä ympäristöjärjestelmän luominen ja ylläpito.

Kesän 2011 työskentelin Oy Nordgolf Ab:ssä ja keräsin tietoja kehitysehdotusta varten. Ehdotus perustuu Oy Nordgolf Ab:ltä saatuihin tietoihin. GEO:n tarkistuslista toimii minimivaatimuksena. Kehitysehdotus on laadittu keväällä 2012. Ehdotukseen sisältyy kirjallisuuteen perustuvaa tietoa sekä käytännön parannusehdotuksia. Mikäli ehdotus pannaan täytäntöön, parantaa tämä Oy Nordgolf Ab:n kestävää kehitystä.

Kieli: Englanti

Avainsanat: Ympäristösuunnitelma, golf ala

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Appendix 1: Environmental plan for Oy Nordgolf Ab

1 Introduction

The knowledge of the strains of which the environment is under is getting clearer all the time. The unsustainable ways natural resources are being used can not continue. People in general have become more conscious of their choices and often the environmentally friendlier alternative is chosen. Many companies have already realized the positive effects sustainable environmental management has, such as a better corporate image. The golf industry has the potential of being a forerunner in sustainability.

This thesis is commissioned work for Oy Nordgolf Ab. The purpose of this work is to produce a development proposition on the environmental plan for Oy Nordgolf Ab that enhances the environmental actions and fulfils the terms required for the Golf Environment organization (GEO) certification. By identification of issues needing development, and by requests of the client I will focus my work on energy use, product and supply chains, recycling and waste, usage of paper and environmental management. The work is done as a part of the GEO certification process, which Oy Nordgolf Ab is applying for. Development practices based on a theoretical background for the chosen issues will be presented. I will also introduce a few golf organizations involved in enhancing sustainability in the golf industry. Finally I will provide implementation suggestions to improve the environmental practices at Oy Nordgolf Ab.

Golf companies and clubs provide versatile surroundings including administrative buildings, restaurants or club houses as well as the courses. The different environmental issues vary from risks of eutrophication caused by excess nutrients to energy use and waste management. Most golf companies are owned by shareholders, and staff changes on a regular basis due to the seasonal nature of golf. To ensure proper environmental management and information flow to all parties good planning is necessary.

My personal goals in this work will be to provide a development proposition that can be implemented by Oy Nordgolf Ab, and to improve my skills in environmental management planning.

2 Environmental sustainability

Companies are in a key role in creating an eco-efficient society. The companies have to follow the minimum rules required by environmental legislation. By expanding their environmental strategies beyond the requirements they can contribute to sustainable development, which can be seen as an investment (Your Europe). The corporate image improves and commitment to sustainable development might even bring economic gain (Finnish environment institute, 2012). In the sectors energy, product and supply chains, recycling and waste, paper use and environmental management companies have a lot of measures that can be implemented. In many cases the implementation does not need huge investments, and the actions not only save money in the long run but also reduce the company's environmental impacts.

2.1 Energy

Energy efficiency can reduce a company's energy use and cut down on the costs originated from energy use. Saving in energy is profitable for a company and does not involve any kind of competition. Besides the economical savings efficient energy use reduces green house gases. With small changes in current practices the company can achieve good results in cutting down energy use (Elinkeinoelämän keskusliitto (EK), 2009).

There are easy ways to reduce energy use in office appliances. You should always make sure that when computers are not in use they are closed, turn on sleep functionality on the office computers. Copying machines should be closed during the night and weekends, and copying should be timed so that as much as possible would be done at the same time. This reduces the energy use needed for the machine to heat up from standby (Motiva 2011a).

Approximately one third of the energy consumption in normal office buildings originates from lighting. To ensure efficient energy use lighting should be well planned. The lights should be switched off when leaving the room for more than ten minutes and you should utilize natural light as much as possible. Fluorescent and energy saving lamps are to a greater extent energy efficient compared to incandescent light bulbs (Motiva 2010).

The optimal temperature in an office is 20-22 degrees. By increasing the temperature by one degree on the air conditioner in the summer saves 5% in energy costs in one year. The same applies when lowering the heat in winter by only one degree. One of the most significant issues affecting the consumption of thermal energy is properly sealed windows

and doors. The insulation should be checked annually. The most energy efficient and swift method for ventilating is using cross-draught. This is only efficient, though, in facilities with no electronic ventilation (Jyväskylän kaupunki et.al. 2007; Motiva 2009).

Many golf facilities are due to their location in an extremely good environment to harness renewable energy such as wind power, solar energy or geothermal heating and cooling. The golf industry could be a front-runner in the utilization of renewable energy (Golf environment organization (GEO) a.).

2.2 Product and supply chains

Environmental and social issues should be integrated into purchasing patterns. Reducing overall consumption, and when purchasing is necessary when choosing energy saving and environmental friendly products minimize the environmental impacts (Jyväskylän kaupunki et.al 2007).

Maintaining and updating old products minimize the need for new purchases. Before buying new, one should always check if the company already has a similar product and if it could be used instead. In some cases the better alternative for purchasing might be to buy a service instead of the product. Recyclable, recycled or ecolabelled products or otherwise a supplier that has the best environmental and ethical performance should be chosen when purchasing new products (GEO b; Jyväskylän kaupunki et.al 2007).

When purchasing electronic equipment the most energy efficient option should always be chosen. Energy labelled electronics ensures optimal energy use. Energy Star or TCO labelled products should be chosen when purchasing office supplies (Jyväskylän kaupunki et.al 2007).

Packaging materials used in shipping items should also be taken into consideration, and product producers who use recyclable packaging materials or rarely use packing materials should be preferred.

Fairtrade coffee and tea ensure a fair compensation to the producers. The Fairtrade principles also include environmentally sound practices (GEO b; Jyväskylän kaupunki et.al 2007).

Preferring local suppliers reduces shipping distances, which cut down on the carbon footprint. Using local businesses as providers for products as well as services not only

reduces the carbon footprint, but also contributes to the economy in the area. Locally produced food and other local materials should be preferred (GEO b.).

2.3 Recycling and waste

The Finnish Waste Act (1993/1072) states that in all activities, it must be ensured that the amount of waste generated is minimized, and that the waste that is produced does not cause significant problems for waste management, the environment or human health (§4, cl. 1). Waste is defined by being a substance or item that the waste holder discards, intends to discard or is obliged to discard (§3, cl. 1). It is the waste holder's duty to ensure that waste disposal is arranged. The waste shall be recycled if possible. Recycling is arranged in a way where the first priority is in recovering raw materials from waste, and the second priority is recovering energy.

Waste shall be collected and kept separated during the whole management process to the extent that is necessary to prevent harm on the environment, health or is needed to ensure proper waste management. This is done within the frame of technical and economical possibilities. Hazardous waste shall be kept separately from each other and from other waste or substances (§6 cl.1-8). The disposal of waste will have to take place at the nearest possible waste disposal facility (§6 cl.10).

The waste producer is responsible for organizing the collection (§7) and transportation of waste (§8).

The best way of managing waste is to prevent the generation of waste. Separation and recycling of waste does not only reduce the amount of waste, but also the costs.

Especially important is the separation of biowaste. One third of the annual general waste consists of biowaste. When biowaste ends up in landfills, it starts to decay and produce methane gas. Methane gas is one of the greenhouse gases.

As much as 80-90% of waste produced in offices consists of paper (Motiva 2011b; Jyväskylä kaupunki et.al 2007).

The most common waste in golf facilities is grass clippings and other residual green waste, waste water, general waste (The R&A a).

Composting is a good and cost efficient way of disposing grass clippings and other green waste. Composting has several benefits when applied on a golf course. The high organic matter in compost can improve the growth of plants as well as the soil quality. It can restrain certain diseases, which might lead to a reduction in the need for pesticides (Wilkinson F. 1994).

Containers that have held fertilizers or pesticides and engine oils, batteries or fuel filters need to be handled with special care (The R&A a).

Of waste generated on golf courses old or surplus pesticides, old fertilizers, oil and oil filters, batteries and old fluorescent lamps are hazardous waste. This kind of waste must be delivered to facilities specialized in disposal of hazardous waste. Pesticides and fertilizers should be stored in a locked, dry space with no drainage. The best way of minimizing waste from pesticides and fertilizers is to purchase at once only the amounts needed during one year (Finnish environment institute 2011 a). All hazardous waste should be identified, separated and properly marked (Heinonen, 2006 56-57).

2.4 Paper use

One million tons of paper is used every day in the world and the consumption is growing all the time. Even though paper is produced from renewable natural resources the paper production generates significant amounts of waste and emissions. The paper industry is one of the world's biggest producers of greenhouse gases, such as methane and carbon dioxide, and a consumer of water and energy (WWF 2007, 3).

By changing the used paper from a heavier 100 g/m² to a lighter 80 g/m² reduces the paper use by 20%. A reduction of 14% is achieved if an 80 g/m² paper is changed to a ten grams lighter 70 g/m² paper. Recycled paper should always be used when possible. When purchasing recycled paper is not possible, ecolabelled paper should be chosen, preferably Forest Stewardship Council (FSC)-certified paper. FSC ensures that the pulpwood is obtained from responsibly managed forests. FSC is recommended by the WWF due to its high standards in quality and reliable audit scheme (WWF 2007, 5-6).

Bleaching paper with chlorine-based bleach causes toxic chlorine compounds in the wastewater. These compounds are called Absorbable Organic Halogenated Compounds (AOX). AOX consists of carcinogenic dioxides that cause cancer (WWF 2007, 10). In Finland chlorine-based bleaching was stopped in 1993 (Kärkkäinen 2007). It is better to

use non-bleached paper or, if bleached paper is necessary, TCF (totally chlorine free) or recycled PCF (processed chlorine free) paper should be used (WWF 2007, 10). Usage of coloured paper should be minimized because it is problematic to recycle.

Paper use can be reduced by minimizing unnecessary copying and copy on both sides of the paper. Wrongly copied or otherwise used paper can be reused as note paper before recycling. By using electronic reporting, writing e-mails in stead of post and saving as much as possible in electronic form, paper is saved (Jyväskylän kaupunki et.al 2007).

2.5 Environmental management

Environmental management ensures that environmental issues are taken into account in all aspects of a company's activities and decision-making (Finnish environment institute 2011). The main purpose of environmental management is to manage companies' actions that may have or have an impact on the environment (Weiss & Bentlage 2006, 19). Environmental management systems (EMS) are tools created to ease the work of tackling different environmental problems.

EMSs provide a method for companies to plan, manage and achieve their environmental goals and responsibilities. The implementation of an environmental management plan can be done differently depending on a company's activity but certain common operating principles should be included (EMAS 2012 a). An EMS has two main goals, pollution prevention, and to ensure companies follow environmental laws and legislations. EMSs are individual for every organization and depend on the specific circumstances of an organization. An EMS is not linked directly to any certification, such as ISO 14001, and can be conducted in a company without any intention of applying for any certification (Weiss & Bentlage 2006, 19-20).

Environmental certification systems are developed by organizations providing certificates. The requirements or specifications as well as the audit system are dependent on the certification provider (Weiss & Bentlage 2006, 20, 27-30).



Figure 1. *Operating principle Plan-Do-Check-Act principle (EMAS 2012 a).*

The most commonly known environmental management system and certification providers are ISO 14001 and EMAS (Finnish Environment Institute 2011 b).

2.5.1 EMAS

EMAS (The European Eco-Management and Audit Scheme) is a voluntary environmental management system developed for the use by companies and organizations both in the private and the public sectors and is limited to the EU. It is based on the EMAS Regulation (EC) No 1221/2009.

The EMAS system consists of an environmental management system that is fully compatible with the ISO 14001 system and public environmental informing, and in compliance with the legislation. (Finnish Environment Institute a) Participation in the scheme has been plausible since 1995, even though until 2001 the scheme was restricted to industrial companies (EMAS 2012 b). The aim of EMAS is continuous environmental improvements in organizations, and organizational supply of environmental information for the public (Weiss & Bentlage 2006, 30). The registration process and the audits are done by external bodies, under the supervision of EU member states which guarantees the credibility of EMAS (EMAS 2012 a).

The number of EMAS registrations in the world is in March 2012 12 627. This includes both sites (8 131) and organizations (4 496) (EMAS 2012 d). The difference between sites

and organizations are that sites can be separate production facilities of an organization that are separately registered. In Finland the corresponding numbers are 22 sites and eight organizations (EMAS 2012 e).

There are several positive impacts of EMAS. Among these is communication with stakeholders improve, due to the EMAS requirement to influence suppliers and associates the knowledge of proper environmental management increases. By attaining the EMAS logo a company can show their compliance with environmental legislation. EMAS is also easily compatible with other management systems, like safety and quality management EMAS is also praised for advantages in internal management (Weiss & Bentlage 2006, 82).

There is also criticism of EMAS. The implementations can be costly compared to the gain. This applies especially to companies with smaller environmental impacts. EMAS requires quantifiable data on environmental savings, which can be hard to provide for various companies (Weiss & Bentlage 2006, 81-82).

2.5.2 ISO 14001

The ISO 14001 is one of the ISO 14000 standards of environmental management developed by the International Organization for Standardization (ISO) (Finnish environment institute b).

The ISO 14001 is the essential standard in the ISO 14000 series, whereas the others are guidelines to achieve ISO 14001. It is also the only standard in the ISO 14000 series which it is possible to be certified in. The ISO 14001 standard was published in 1996. It does not cite any environmental requirements, but specifies the criteria for an environmental management system (ISO 14000 2002). Work to revise the ISO-14001 standard has started in early 2012 (Suomen standardisoimisliitto 2012). The main areas in an environmental plan according to ISO-14001 are following of the environmental laws and regulations, continual improvements and prevention of pollution (Weiss & Bentlage 2006, 49). The ISO 14001 standard utilises the Plan-Do-Check-Act principle (EMAS 2012 a).

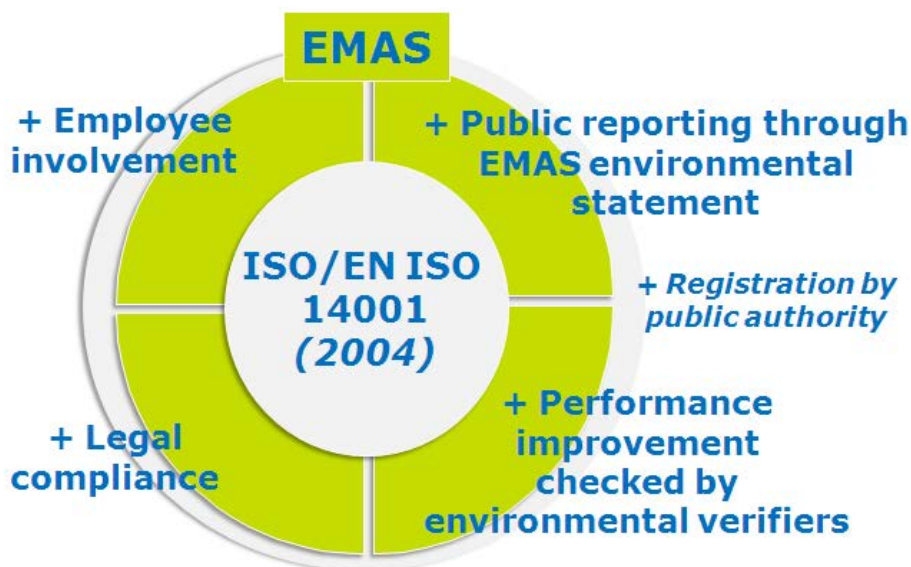


Figure 2. Figure showing the integration of ISO-14001 into EMAS (EMAS 2012 c).

The number of ISO 14001 certified organizations in 2007 was 129 031. In Finland 991 certified organizations could be found (ISO 14001 registered companies 2007).

ISO 14001 provides guidelines for environmental management. The organizations implementing ISO 14001 benefits from reducing costs and gaining a better environmental image. By establishing a proper EMS the company also strives for continuous improvements, which may lead to continuous savings. ISO 14001 is compatible with other standards, such as ISO 9001. A company that already has one of the ISO standards in use can develop the management system to meet the requirements of both standards without a lot of effort (Weiss & Bentlage 2006, 34, 73-74).

The ISO 14001 standard is criticised of being too general. This is because there are no actual targets that need to be met, and it is enough to follow the environmental laws and have an intention to lower environmental impacts (Weiss & Bentlage 2006, 83).

2.5.3 Comparison between EMAS and ISO 14001

The differences between ISO 14001 and EMAS are that ISO 14001 is an international standard provided by a non-governmental organization, while EMAS is restricted to the EU and is based on government regulation. EMAS is more strict than ISO 14001, partially because ISO 14001 has to have a standard that can be implemented anywhere in the world, and also because EMAS requires that all legislation needs to be incorporated while ISO 14001 only requires that the environmental legislation is followed. EMAS requires all environmental information to be public, while ISO 14001 only requires that the

environmental policy should be made public. ISO 14001 has more registered organizations and is better known and recognized by the public than EMAS (Weiss & Bentlage 2006, 32,82).

The major weakness of both EMAS and ISO 14001 is that the registration fees can be very costly, there are no fixed fees, which leads to the fact that the expenses vary depending on the country. In some cases organizations are not able to attain an EMS due to the high costs. Another weakness is the fact that neither of the certificates ensures that a company's actions are environmentally sound. The only thing that is required is that a company tries to improve their environmental actions (Weiss & Bentlage 2006, 83).

2.5.4 Green Office

Green Office was developed in 1997 by WWF Finland. Green Office is an easy way to implement EMS. The main purpose of Green Office is to reduce the ecological footprint and greenhouse gas emissions in a workplace. It is suited for both large and small offices in the private as well as the public sector.

WWF provides tools for setting up and maintaining an EMS for offices that are enrolled in the WWF network. A Green Office is not free; there are admission fees as well as annual fees that need to be paid. The fees depend on the amount of employees in the office.

The criteria of a Green Office include proper environmental management and information flow to the staff, improvement in energy efficiency, waste reduction and annual updating of the environmental plan. The environmental goals that can be measured are set by the company. Monitoring is also done by the office, only annual reports are sent to WWF. When the required criteria are fulfilled in a company's EMS, use of the Green Office logo and a diploma are granted the company.

Currently there are 200 organizations in the Green Office network and 175 of them have been presented with the diploma and the Green Office logo (WWF 2012).

2.5.5 The Swan

The Swan is a Nordic ecolabel established in 1989 by the Nordic Council of Ministers. It provides ecolabelling for products as well as services.

Different product groups have different criteria. The criteria for each product group are compiled within Nordic cooperation. During the compiling process the public has an opportunity to give their opinion on the criteria.

Application for the Swan ecolabel is done by application forms and the forms are processed by secretariats in the different Nordic countries. The secretariat grants the ecolabels and monitors the use of the label. In Finland the secretariat is Ympäristömerkintä. The fees for the Swan ecolabel are the admission fee and a changing annual fee.

The Swan ecolabel is well known throughout the Nordic countries. (Ympäristömerkki) There is one golf and hotel resort, Marsviken in Sweden, that has been granted the Swan ecolabel (Marsviken).

2.5.6 Golf environment organization

The Golf Environment Organization (GEO) was established in 2005 and its headquarters is in North Berwick, Scotland. GEO is a non-profit global stakeholder funded organization. Among others the stakeholders include the R&A, European Golf Association, WWF and UNEP. The organization is governed by a board of directors, advisory council and technical commission.

GEO works with helping the golf community to enhance sustainability and provides online guidance programs and support from independent golf experts to ease implementation of sustainable practices (GEO c). There is a global network group of independent golf experts. They are trained in the GEO program and are called GEO sustainability associates (GEOSA) (GEO d). The GEO also provides the GEO Certified ecolabel. A golf course can apply the ecolabel by registering to the online program OnCourse. The OnCourse program consists of several topics from water use to people and communities (GEO e).

At the moment there are 58 certified golf clubs worldwide. Hirsala golf in Kyrkslätt is the only one in Finland. Enrolled as applicants are 253 golf establishments globally of which 25 are in Finland (GEO f).

The GEO certification process starts with registration to the OnCourse program. The program consists of six action areas, landscape & ecosystem, water, energy & resources, product & supply chains, environmental quality, and people & communities.

The golf club inserts data about their practices into the program at their own pace. The club has a time space of three years to complete the application and make improvements in their actions, if necessary. When all data is inserted and the application is ready an administrative fee of 180 EUR is paid to GEO (GEO f).

The company chooses a GEOSA verifier who visits the club. The verifier evaluates the golf establishment and does a verification report. The evaluation criteria are gathered in simple checklists, one list of criteria that the golf club must fulfil, and another list of criteria the club should fulfil. If the verifier recommends the certification and the GEO review backs the decision the GEO Certified ecolabel is appointed the golf club. The ecolabel is valid for three years. When a club is appointed the ecolabel, information about the club as well as the application checklist, with comments from GEO about the current situation, is published on the GEO website. The verifier provides the company with a continuous improvement plan, with ideas of further development that can be implemented during the three-year period before re-certification (GEO f).

GEO OnCourse™ Evaluation Criteria

CRITERIA CHECKLIST / MUST

<p>MANDATORY REQUIREMENTS</p>	<p>Use the following checklists to self assess eligibility for the GEO Certified™ award. The following requirements must be met by successful applicants:</p>
<p>LANDSCAPE & ECOSYSTEMS</p>	<p>Demonstrate a sound understanding of the ecology, ecosystem and aesthetic (landscape) value of the site. <input type="checkbox"/></p> <p>Be aware of conservation designations for protected sites, habitats, species or landscapes. <input type="checkbox"/></p> <p>Be able to explain why the grass species being maintained provide an optimal balance between playing condition requirements, the efficient use of resources, and minimal reliance on chemical pest control. <input type="checkbox"/></p>
<p>WATER</p>	<p>Provide baseline figures for total annual water consumption, split into different management areas if possible (clubhouse, golf course, maintenance facility). <input type="checkbox"/></p> <p>State sources of water used. <input type="checkbox"/></p>
<p>ENERGY & RESOURCES</p>	<p>State total energy and fuel consumption per annum, broken down by renewables and non-renewables. <input type="checkbox"/></p> <p>state the total number of operational vehicles under ownership or control. <input type="checkbox"/></p>
<p>PRODUCTS & SUPPLY CHAINS</p>	<p>Have an established ethical and environmental purchasing policy. <input type="checkbox"/></p> <p>Provide baseline data for fertiliser and pesticide use. <input type="checkbox"/></p> <p>Describe and demonstrate all current waste management operations. <input type="checkbox"/></p> <p>Demonstrate legal compliance in waste management. <input type="checkbox"/></p>
<p>ENVIRONMENTAL QUALITY</p>	<p>Identify where all waste water and runoff goes after leaving property. <input type="checkbox"/></p> <p>Maintain a register of all hazardous materials. <input type="checkbox"/></p> <p>Demonstrate legal compliance in the storage, handling and safe disposal of all hazardous substances. <input type="checkbox"/></p>
<p>PEOPLE & COMMUNITIES</p>	<p>Maintain a register of full and part time employees, including all staff roles and responsibilities. <input type="checkbox"/></p> <p>Have an environmental working group comprising key staff, volunteers and external advisors. <input type="checkbox"/></p> <p>Maintain a register of any historical, cultural or archaeological designations that apply to the site. <input type="checkbox"/></p> <p>Not have any legal disputes affecting the site, and openly declare any controversy or community conflict connected to the facility or related business activities. <input type="checkbox"/></p>

GOLF ENVIRONMENT ORGANIZATION | GEO

Criteria Checklist / MUST

Figure 3. GEO checklist on criteria the golf club must fulfil (GEO g).

Some verifiers even provide additional help in the re-certification process by an additional visit one year after the GEO Certified ecolabel is acquired to support further development and ease the re-certification. The verification fee paid to the independent GEOSA verifier varies by country. In Finland the fee is dependent on the amount of holes on the golf course. For Oy Nordgolf Ab the fee for two 18-hole courses is 1500 EUR (Personal communication with GEOSA verifier Kari Mattila Aug. 18, 2011). There are at the moment three independent GEOSA verifiers in Finland (GEO d).

2.5.7 Comparison between ISO 14001, EMAS and GEO

The three systems ISO 14001, EMAS and GEO have several similarities, but also differences. The main difference between the systems is their requirements. In GEO certain environmental requirements need to be met, whereas ISO 14001 and EMAS do not require environmentally sound actions. Another difference is the compliance with legislation. In this field both ISO 14001 and EMAS are stricter than GEO. EMAS as well as ISO 14001 are based upon developing an EMS, where GEO does not require an EMS to ensure certification.

Even though the organizations have different management systems they all use external auditing bodies and have certification fees.

Element	ISO 14001	EMAS	GEO
Requires EMS	YES	YES	NO
Compliance with legislation	Only environmental legislation	YES	Only waste legislation
Geographic area	Worldwide	EU	Worldwide
Requirements that need to be met	NO	NO	Yes, GEO checklist
Continuous improvements	YES	YES	Only to ensure re-certification
Specific field of improvement	No, any environmental issues that can be monitored can be used	No, any environmental issues that can be monitored can be used	Improvements when re-certified within the six action areas

External auditing body	YES	YES	YES
Management system	Non-governmental	Governmental	Non-governmental
Public informing	Only environmental policy	YES	YES
Registration or certification fees	YES	YES	YES

Tabel 1. Comparison between ISO 14001, EMAS and GEO

3 Golf and the environment

Golf is one of the fastest growing recreational activities in the world (Laukkanen et.al 2006,13). Golf will become an Olympic sport from 2016, and this will further increase the growth of the game (World Golf Foundation 2011 a). The golf industry has for years worked on environmental responsibility on golf courses and is striving for sustainability. The leading golf organizations have made invested extensive resources into assuring that this will be fulfilled (World golf foundation 2011 b). According to several golf oriented organizations, like the Finnish Golf Association, the main issues that need to be properly managed in a golf facility are water use, turf grass management, energy use and waste management.

3.1 General information

The game of golf was created in Scotland and got its current form in the 12th century. It was not until the 19th century that golf started spreading from Scotland to other countries.

There are approximately over 30 000 golf courses and 55 million players worldwide. The total area of an 18-hole golf course is 55-65 ha. In Europe golf courses cover 250 000 ha of land. The corresponding number in Finland is 7 000 ha.

The first golf club in Finland, Helsingin golfklubi, was established in 1932. The Finnish Golf Association was established in 1957 (Laukkanen et.al 2006, 7-13). Today there are 132 golf clubs, over 150 golf courses and about 142 000 golfers in Finland. The interest in golf started growing in the 1980's and it still continues to grow (Finnish Golf Association a).

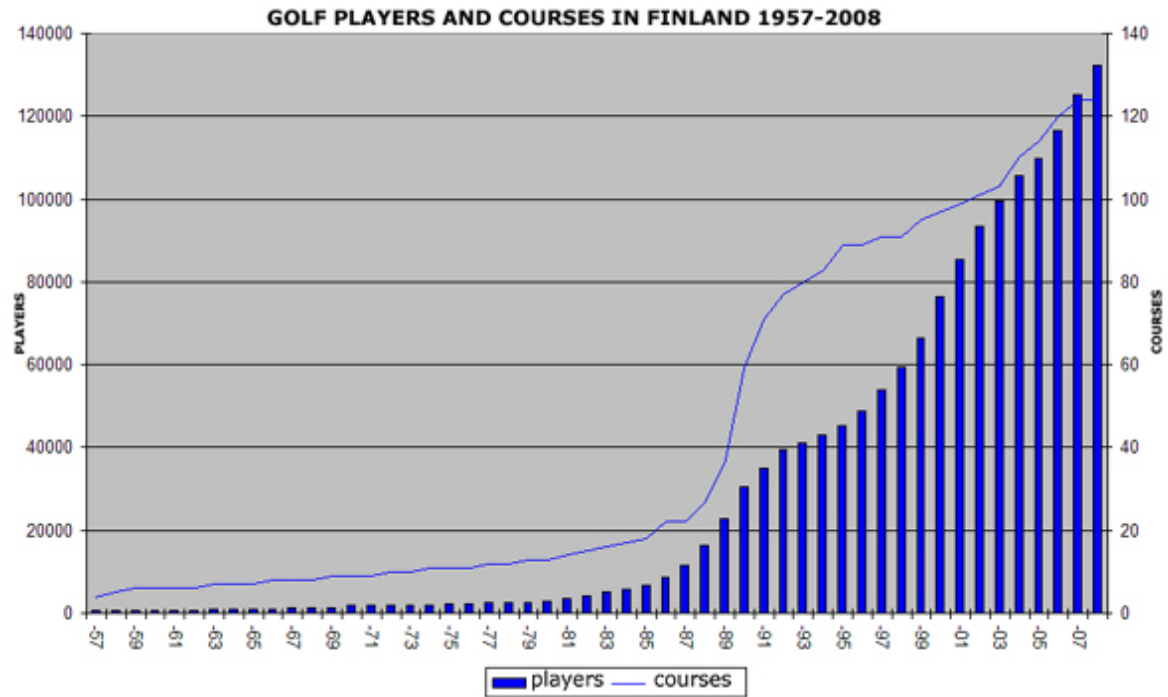


Figure 4. The growth in amount of golfers and courses in Finland since 1957 (Finnish Golf Association a).

3.2 Golf organization involved in improving the environment

3.2.1 The R&A

The R&A was formed in 2004 and is based in Scotland on the grounds of the Royal and Ancient Golf Club of St Andrews.

The R&A works in various fields from administrating the Rules of Golf to preserving golf's heritage. The R&A is divided into departments with different focusing points. The course management department is devoted to providing the best practice tools. They provide tools from environmental sustainability and social responsibility to best economic performance (The R&A).

3.2.2 Finnish Golf Association

The Finnish Golf Association was established in 1957 by Helsingin Golfklubi, Kokkolan Golf, Porin Golfkerho and Viipurin Golf. The Finnish Golf Association works as a national central organization for golf clubs in Finland. The Golf Association serves as a service and expert organization, providing service and support for golf communities. The association

focuses on everything from supporting junior golf to course management (Finnish Golf Association b).

The first environmental program for golf was developed in cooperation with the Finnish Golf Association and environmental authorities in 1995 (Laukkanen et.al 2006, 15). Today the Finnish Golf Association has a daughter company owned entirely by the association called Finnish golf consulting Oy. The daughter company takes care of the association's consulting, education and publishing tasks. Finnish Golf Consulting Oy has developed an environmental handbook for golf clubs (Golfkentän ympäristökäsikirja) in 2006 (Finnish Golf Association c). The Finnish Golf Association also provides simple rules and material on how to develop an environmental management system (Finnish Golf Association d).

4 Oy Nordgolf Ab

4.1 General information

Nordcenter is a golf and leisure centre located by the coast of the Pojo Bay, in Pojo, which is a part of the municipality of Raseborg. Oy Nordgolf Ab was established in 1986. The first golf course, Fream, was opened in 1988 and the second, Benz, in 1994. The entire Nordcenter area is about 200 hectares, of which Oy Nordgolf Ab owns 152 ha. The golf club has about 1100 members and approximately 1 000 shareholders.

The centre consists today of two 18-hole golf courses, two tennis courts, a clubhouse, maintenance building, office building, locker-room and sauna, bed and breakfast facility and cold storage space. Most of the buildings are old, with the clubhouse, Åminnegård, dating back to the 18th century.

Within the Nordcenter area there are almost 100 summer houses divided into smaller housing cooperatives, which are mostly privately owned and not administered by the company (Nordcenter).

The company has 11 persons working the year around and during the golf season, from April until the end of October the amount of staff may increase by up to 50 people.

4.2 Current environmental practices

Oy Nordgolf Ab follows its own existing environmental plan (appendix 1). The plan was conducted in 1997 by the company with the help of experts from the Finnish Golf Association. The following information is gathered from the environmental plan and through discussions with the head greenskeeper Staffan Lundmark.

Oy Nordgolf Ab is connected to the municipal water system, and all water, apart from the water used for irrigation and one toilet on the Benz course, is provided through it. The irrigation system utilizes water from the nearby Svartå River. There are two pumping stations in the river and the water is pumped in to two ponds, which function as water hazards on the course, one located on the Fream course and the other on Benz. Both courses have their own computer driven irrigation system. On Fream there are 503 pop-up sprinklers and the maximum capacity of the irrigation system is 1050 m³ during ten hours. Benz has 972 pop-up sprinklers and a maximum capacity of 2000 m³. The maximum capacity on either course almost never needs to be used. The irrigation is very important on the course due to the soil being a mix of turf and sand. The drainage system in Benz leads the water either to the forest for filtration or to the pond, where it is re-used for irrigation. On Fream the drainage leads the water back to the irrigation system, into the forests and the water runoff that flows into the Pojo Bay is led to flocculation ponds for purification before leading the water into the bay.

Oy Nordgolf Ab tries to use organic nutrients always when possible. The amount of nutrients given at one time is small so that almost everything of it is absorbed directly by the plants. This is done to minimize runoffs. Near water bodies the nutrients are spread out very carefully and a buffering zone is left around any water bodies. Pesticides are only used when necessary. The spraying usually happens in the spring and later in the autumn. The amount of pesticides used during one year at Oy Nordgolf Ab is less than 5 kg. When pesticides are sprayed special warnings are put up for the players to ensure safety.

The amount of water that is used and the quality of the water are monitored and annually tested by Länsi-Uudenmaan vesi ja ympäristö. Consumption of electricity and the amounts of nutrition and different pesticides used on the course are monitored.

In 2009 a report on flora and fauna found in the Nordcenter area was compiled. The whole report on flora and fauna can be found on the company's website.

At Oy Nordgolf Ab the main responsibility of environmental management is on the head greenskeeper. The assistant greenskeeper has taken over some of the environmental monitoring, mainly connected to the management of the courses, such as use of pesticides.

5 Work description

I had previously been working for Oy Nordgolf Ab and at a meeting with the CEO discussing the opportunities of working there again he approached me with a proposal of doing my internship and thesis for the company. Oy Nordgolf Ab was planning to apply for a GEO certificate and wanted help with gathering data, assessing the current situation and to develop a proposition on the existing environmental plan to fulfil the certification requirements.

I started my work for the company in May 2011 and worked until the end of October 2011. I was introduced to the work by the head greenskeeper, who answers for the certification process at the company. I was given information about the current environmental practises and access to the companies OnCourse online program.

When the preliminary research was done, I focused on identifying the aspects in the current activities that could be developed. Through discussions with staff members and golfers, who also are stakeholders, I narrowed down the issues that needed development. The head greenskeeper had requests regarding the focusing points of the work, and by combining these the final result was a development proposition including energy use, product and supply chains, recycling and waste, paper use and environmental management in accordance with GEO's guidelines. Water use and turf grass management were left out partially because the current practices exceed the requirements set by GEO and because these actions are already well planned and monitored. After the internship I started researching literature on the best environmental practices of the specified areas and produced the research questions. The research questions are:

- How could Oy Nordgolf Ab develop the current environmental activities?
- Does Oy Nordgolf Ab meet the GEO checklist requirements?

6 Methods

I used the GEO checklist (fig. 3) as the minimum criteria that needed to be fulfilled. For gathering information I used several governmentally based companies' and administrative bodies' websites such as Motiva Oy and Finnish Environment Institute.

The book "Environmental management systems and certification" by Weiss and Bentlage is used as the main source of information regarding environmental management. The GEO website and the Finnish golf associations website and the environmental handbook *Golfkentän ympäristökäsikirja* by Kristiina Laukkanen et.al was a good source of information regarding the golf environment.

For site specific information regarding Oy Nordgolf Ab the head greenskeeper Staffan Lundmark and the head caddiemaster Ann-Christine Gustafsson provided it when needed.

7 Implementation suggestions

I will give site-specific practical suggestions of implementations based upon my observations of the company's actions. The current practices are described in every chapter before the suggestions.

7.1 Energy

7.1.1 Current practices

At Oy Nordgolf Ab electricity is bought annually on the stock market. So far no green energy has been bought by the company. The company uses electric heating and the sauna and locker room building as well as the office have air conditioning.

The lawn mowers are mostly hybrids, utilizing both electricity and fuel. There are electric golf cars, which are for hiring purposes, and a few fuel driven golf cars that are used by staff members.

In the office the computers are always left on even during night-time.

7.1.2 Improvement suggestion

Oy Nordgolf Ab should commit to reducing energy. The municipality of Raseborg has committed to reducing energy use by 9% by 2016 (Kurkisuo & Haaspuro 2012, 1). Oy Nordgolf Ab could execute the same reduction.

Both computers and computer screens should always be closed during the night and preferably also during lunch breaks.

Renewable energy sources should be considered. Because of the ideal environment by the sea shore, wind power could be a good alternative in my opinion. Another alternative for heating could be to build a wood combustion power plant on the premises which would cover heating of all the buildings owned by the company.

In facilities that are not in use during the winter, the temperature should be reduced to a minimum. Insulations in all facilities should be checked and repaired in the fall if needed.

7.2 Product and supply chains

7.2.1 Current practices

Oy Nordgolf Ab uses local suppliers in almost all external services needed within the golf club. Lawn mowers for golf facilities are not manufactured in Finland, but the importer that the company mainly uses is located in Vanda. The same company also imports golf cars.

Fertilizers and pesticides used by the company are not golf specific and are bought from the closest provider of agricultural goods.

Fairtrade and locally produced food have been used in the restaurant while it was a part of Oy Nordgolf Ab.

7.2.2 Improvement suggestion

Due to the fact that the golf industry is not so big in Finland, the purchase of local goods is hard, but should always be preferred if possible. By trying to ensure that goods are provided within a 100-kilometre radius from the golf club would minimize transportation.

Usage of local service providers should continue, and if new actions that need services should occur, a mapping of possible local providers should be done.

Staff members, golfers and the independent restaurant entrepreneur should be encouraged to use locally produced food and Fairtrade labelled products. The restaurant contractor should also be encouraged to use seasonal food.

Proper purchasing methods should be ensured by developing an environmental purchasing policy.

7.3 Recycling and waste

7.3.1 Current practices

Oy Nordgolf Ab follows the Finnish waste legislation. Hazardous waste is separated properly. On the golf courses there are separating waste bins with biowaste, municipal solid waste and bottles and cans. Even though the waste is separated on the course, both biowaste and general waste are placed in the company's waste compactor. The annual amount of waste is not monitored by the company.

Golf cars and lawn mowers are currently washed in a paved area with only a cesspit. Most of the grass clippings end up in a bank beside the current washing area.

7.3.2 Implementation suggestion

Separate trash cans for energy and bio waste should be implemented in the staff's coffee break rooms. Newspaper, other paper and cardboard should be collected separately. The separation of paper waste was implemented by me during my internship.

Oy Nordgolf Ab should invest in building proper composting and a washing area for machinery used on the field. The washing area should include an oil separation well and a septic tank. That would ensure that grass clippings, which at the moment go to waste, would also be composted.

Cooperation in waste management with housing cooperatives should be considered. This could be executed by making an agreement with a housing cooperative where in exchange for compensation the tenants would be allowed to use the company's waste bins for different separated waste.

Currently the toilet located on the course uses water from the irrigation system. Composting toilets should be considered for the restrooms on the courses. Installing composting toilets would not only reduce water use and enforce composting but also save energy.

7.4 Paper use

7.4.1 Current practices

Paper use is not monitored or restricted at Oy Nordgolf Ab. The environmental plan does not mention the usage of paper.

7.4.2 Implementation suggestion

Oy Nordgolf Ab should reduce paper use. Currently a lot of paper goes to waste, even though wrongly printed paper is often used as note paper.

All information sheets for golf competitions are a problem because in many cases last minute changes occur after printing which generates a lot of paper waste. The information sheets should be printed preferably in the morning of the competition.

E-mails should not be printed, and if needed to be saved, it should be done in electronic form.

In printing paper as well as toilet and hand paper, recycled, ecolabelled and chlorine free paper should be chosen. A change to textile hand towel rolls in restrooms should be considered.

Bills that come in to the company are in paper form and are sent to the accounting company by post. The invoicing at Oy Nordgolf Ab is also on paper. Invoicing should be done electronically and a change to at least a partial electronic invoicing system should be considered.

Replacing paper scorecards by an electronic system would be a good investment. Gamebook, which is an electronic real-time event scoring system, has already been implemented in a few golf clubs in Finland and used at Nordcenter for a couple of competitions. Electronic scoring systems not only save paper but also show the way of the future.

7.5 Environmental management

7.5.1 Current practices

Environmental management at Oy Nordgolf Ab is based upon the environmental plan (appendix 1), the Finnish Golf Association's environmental handbook and the efforts of the head greenskeeper.

7.5.2 Implementation suggestion

Oy Nordgolf Ab should establish an environmental team. The team should have representatives from the staff, shareholders, restaurant and the housing cooperation.

The company could consider applying for the ISO-14001 standard or strengthen the environmental policies at the office by implementing the Green Office EMS after accomplishing the GEO Certified ecolabel, which would improve the sustainability and the company's image even further.

One or two of the staff members should be appointed in charge of the environmental management in forms of implementation and monitoring, and improvements of actions.

Due to the change in amount of staff and people, information packages about the environmental policies of the company should be included in the introductory package given out to all new staff members. This would ensure that every member of the staff is aware of the environmental actions.

Information about environmental policies should also be accessible on the company's website and found at the office. Reminders of sustainable actions could be included every now and then in the weekly newsletter.

A golf competition with sustainability as the theme could be arranged. This would be a pleasant way of providing information on environmental issues and policies for the golfer.

Shareholders and staff members should be encouraged to give new ideas in, for example, energy reduction. This could be enforced by an idea box placed in the office and a prize could be given for the best idea.

8 Discussion

The purpose of this work was to give a development proposition of the existing environmental plan for Oy Nordgolf Ab. This was done by observations on site, research on current actions and recommendations provided by GEO and related literature. The proposition focused on the issues most in need of development. By including direct requests of development from the client a greater possibility of enforcement was established. The literature provided good ideas and suggestions for improvements in environmental performances. Several organizations provide guidelines for an EMS. Proper management and knowledge of the different environmental issues could be ensured by implementing an EMS at Oy Nordgolf Ab. The EMS provider should be chosen based on how elaborate the company is willing to make the EMS.

The first research question “*How could Oy Nordgolf Ab develop the current environmental activities*” was answered with both literature based information and practical implementation suggestions. Some of the improvements based on literature have already been partly in use before the proposition at Oy Nordgolf Ab but a strengthening of current actions could be implemented. I think that it would be easy for Oy Nordgolf AB to expand their current environmentally sound practices from the field work to include all the different elements within the company.

Based on my research of the company’s actions regarding the second question “*Does Oy Nordgolf Ab meet the GEO checklist requirements*” I would say that the requirements are not fully met at the moment. By implementing an environmental team, improving waste management and developing an environmental purchasing policy the minimum requirements for the GEO ecolabel should be met. All these factors are included in the implementation suggestions.

I think that the development proposition can be implemented without huge costs or drastic changes in current actions at Oy Nordgolf Ab.

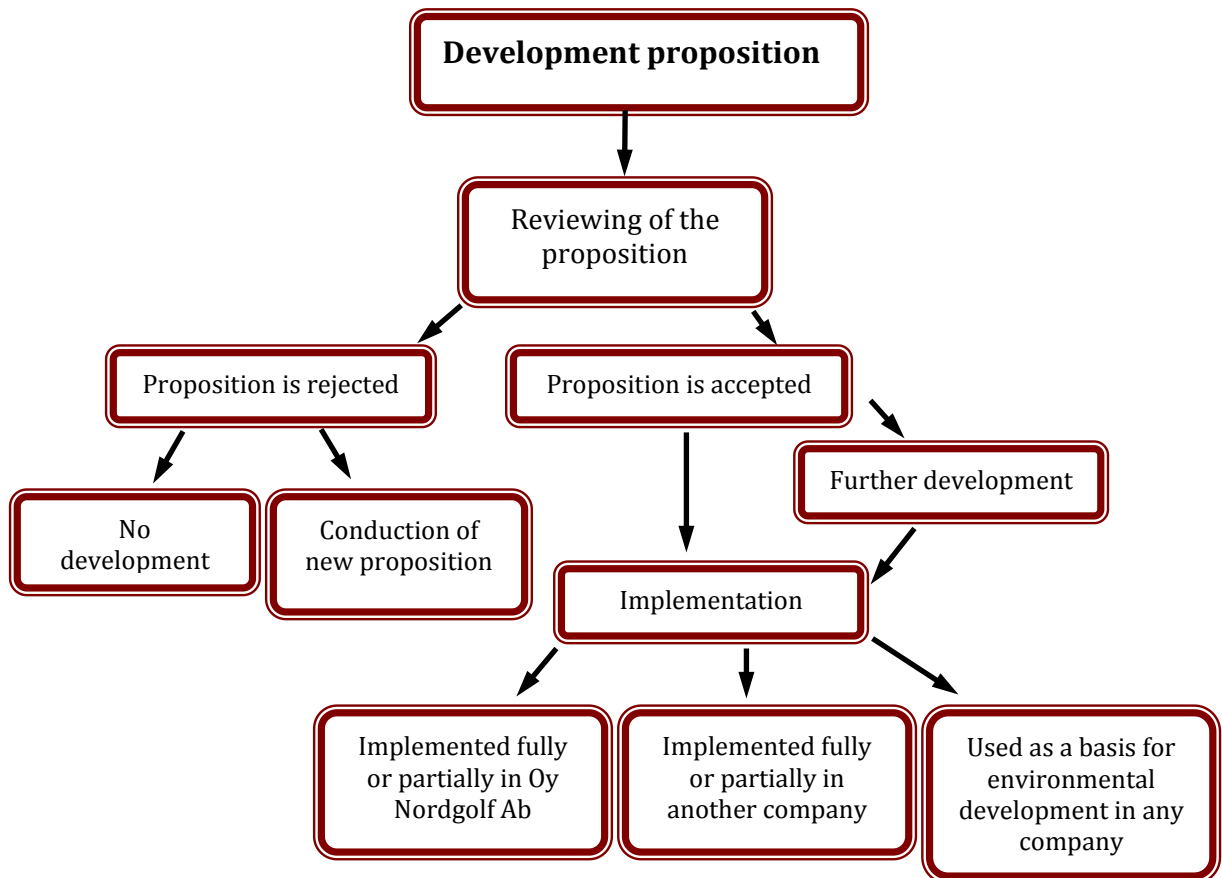


Figure 5. Model on plausible further usage of the proposition.

The model (fig.5) illustrates different scenarios for further use of the proposition. Besides the possibility of it being implemented at Oy Nordgolf Ab, it can also be implemented in another golf establishment or partially in any company. It can also provide a basis for any company developing their environmental management.

Even though a lot of information was provided from Oy Nordgolf Ab, more exact figures of, for example, energy use would have facilitated the work at hand. It would also have provided the opportunity to use tools created for assessing the current situation, such as carbon footprint calculators. A deeper understanding of all the aspects that should be considered when conducting an environmental proposition would probably have improved the work.

9 Conclusion

In conducting environmental plans for the golf industry a lot of actions have to be considered. It would have been interesting to include all environmental aspects found on a golf course in this work, but due to time limitations that would have been impossible. Information regarding environmental improvements and different certifications and environmental management systems are easily found and usually quite easy to implement. This shows that environmental issues and their management are important to consider, not only in companies but in every aspect of one's life.

There is a connection between all environmental issues, and if one is managed more poorly than the other, the overall positive effects can be reduced. While conducting this work I have learned a lot about certification processes and development of environmental plans. Oy Nordgolf Ab has well structured environmental planning regarding field work, and hopefully an implementation of this proposition will occur and there will be improvements also in the other units of the golf club.

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OY NORDGOLF AB:N YMPÄRISTÖOHJELMA

1. TAUSTA

SGL julkaisi huhtikuussa 1995 liiton ympäristöohjelman joka ymmärrettävistä syistä oli laajana kokonaisuutena seuroille vain suuntaa antava.

Nordgolf haluaa omalta osaltaan edistää oman alueensa ympäristösuojelua ja toimia yhteistyössä paikallisten viranomaisten ja golfliiton kanssa.

Nordgolf on toteuttanut kenttähankkeensa ottaen huomioon jo ennakkoon ympäristön-suojelulliset näkökohdat molemmissa projekteissaan jo kenttien suunnittelu- ja rakennusvaiheissa.

Nordgolfin sijainti arvokkaan Pohjanpitäjänlahden alueella vaikuttaa oleellisesti kaikkeen kentänhoitoon ja rakentamiseen liittyviin toteutuksiin. Nordgolf toimii jo yhteistyössä SGL:n kanssa ja yhtiön omistamilla kentillä on käynyt jopa ulkomaisia viheraktivisteja tutkimassa alueemme päästöjä ja niiden merkitystä vesistölle ja aluetta ympäröivälle luonnolle.

2. TAVOITTEET

Tämän ohjelman tavoitteena on saada kentänhoidossa ohjeita toteuttava taso noudattamaan vastuullisen ympäristönhoidon periaatteita. Päämäärinä on ottaa huomioon luonto ja sitä ympäröivä kulttuurimiljö sekä samalla taata osakaskunnalle korkeatasoinen ja hyvinhoidettu peliympäristö.

Tutkimuksissa joita Nordgolf itse, SGL sekä Ruotsissa vastaavat tahot ovat tehneet, on selvästi kyetty osoittamaan lannoitteiden sekä eri torjunta-aineiden kulkeutumisen ympäröivään luontoon olevan lähes minimaalinen.

Omalla ympäristöohjelmallaan Nordgolf haluaa osoittaa alueella asuvalle väestölle, osakaskunnalleen sekä viranomaisille tavoitteenaan olevan luonnon suojelemisen.

3. YMPÄRISTÖNSUOJELU

3.1. Vesiensuojelu

3.1.1. Vesilain säädökset

Suomessa toimii 13 alueellista ympäristökeskusta joiden tehtäviin kuuluu vesilain valvonta. Nordgolf noudattaa kaikkia Suomen vesilain säädöksiä mitä golfliiton asiakirjoissa on mainittu, joista keskeiset periaatteet sisältyvät ns. pohjaveden pilaamiskieltoon ja pohjaveden muuttamiskieltoon. Muita vesilain säännöksiä on vielä vesistön pilaamiskielto, vesistön muuttamiskielto sekä vesistön sulkemiskielto, jotka kaikki löytyvät ko. asiakirjasta. Tärkeimpiä Nordgolfin kannalta on kentällä tarvittava kasteluvesi, johon tarvitaan vesioikeuden lupa jos em. yleiskieltoja rikotaan siinäkin tapauksessa että tarvitsija omistaa vesialueen.

2(8)

3.1.2. Kuormittavat tekijät ja haittojen estäminen

Vesiensuojelun kannalta olleellisen riskitekijän muodostaa typen, fosforin ja torjunta-aineiden huuhtoutuminen pinta- ja pohjavesiin.

Oman vesiensuojelun toimenpiteitä edellyttävän kohteen muodostavat golfklubin sosiaali-, sauna- ja pukuhuonetilojen saniteettivedet sekä ravintolantoiminnan yhteydessä syntyvät jätevedet. Nordgolf toimii kuitenkin kunnallisessa verkostossa joten ko. kysymykset eivät aiheuta sen vuoksi erityisongelmia vaan näin muodostuvat jätteet on hoidettu kunnallistekniikan avulla.

Pohjaveden suojeleminen on vesiensuojelun kannalta tärkein. Eri tutkimusten mukaan erittäin hankalaksi aineeksi on muodostunut typpi. Huuhtoutumisriskin typen osalta aiheuttaa nitraatti. Eri tutkimusten mukaan huuhtoutumaan vaikuttavat eri tekijät mutta näiden tutkimusten valossa golfkentiltä pohjavesiin suotautuvan veden nitraattipitoisuus jää alle 10 mg/l. Huuhtoutuva typpi lisää myös pintavesien ravinteiden määrää. Nordgolf tulee tutkimuksissaan keskittymään yhteistyössä viranomaisten kanssa juuri nitraatti-tyyppipitoisuuden vesistölle aiheuttamiin vaikutuksiin sekä sen haitallisuutta pohjavesiin.

3.2. Golfkenttien hoito

Nordgolfin kentät muodostuvat kahdesta suunnittelijan mukaan nimetystä 18-reikäisestä pelialueesta, jonka leikkauspinta-alat näkyvät ohessa.

	<u>Fream-kenttä</u>	<u>Benz-kenttä</u>
Viheriöt	~ 1 ha	~ 1,3 ha
Lyöntipaikat	~ 1,3 ha	~ 1,3 ha
Väylät	~ 20 ha	~ 22 ha
Esikarheikot	~ 1,2 ha	~ 1,5 ha
Karheikot	~ 15 ha	~ 20 ha

Harjoituskenttä, erilaiset esteet, polut ja tiet sekä muu ympäristö kartanopuistoinen ja leikkikenttineen muodostaa 152 ha:n maa-alueen joita hoidetaan tarpeen mukaan.

Kentänhoidossa lannoitteiden käytön tarkoituksena on luoda suotuisat kasvun edellytykset.

Pelikausi Äminneforsissa vaihtelee huhtikuun alusta lokakuun loppuun, joskus leutona syksynä jopa marraskuun alkuun. Keskimääräinen pelikauden pituus on n. 200 vrk.

3.3. Golfkenttien lannoitus

Valtaosa Nordgolfin golfkenttien lannoituksesta tapahtuu rakeistettuja moniravinnelannoitteita käyttäen. Näistä lannoitteista usein ainakin typpi on hidasliukoista. Rakeisten lannoitteiden käyttö on käytännön syistä miltei pakollista, koska niillä lannoitettavat alueet ovat laajoja (väylät ja karheikot).

Lannoitus tehdään orgaanisilla-, rakeistetuilla- ja nestemäisillä lannoitteilla. Sekä orgaaninen että nestelannoitus lisääntyy rakeisten kustannuksella, koska vaara ympäristölle ja lähinnä vesistölle on näitä lannoitusmuotoja käyttäen huomattavasti pienempi.

Lannoituskertoja on useita ja annettavat ravinnemäärät pieniä kerta-annoksia, jolloin kasvi ehtii käyttää annetut ravinteet ja huuhtoutumisvaara on pienempi. Kaiken perustana on kasvu-alustan antama ravinnetasapaino sille kasville, jota viljellään.

3(8)

Lannoitesuorite vesistöjen välittömässä läheisyydessä suoritetaan tarkkuuslevityksenä, vesistön ja lannoitetun alueen väliin jäätävä lannoittamaton suoja-alue,

Oy Nordgolf Ab:n kentillä käytettävät puhtaat ravinnemäärät kasvukauden aikana:

		<u>Fream-kenttä</u>	<u>Benz-kenttä</u>
Viheriöt	kg/ha	180-220	200-220
Tiit		110-150	130-170
Väylät		50-70	70-90
Karheikot		20-30	20-40

3.4. Torjunta-aineiden käyttö

Kasvit ja taudit joita torjutaan:

- rikkakasveja
- apilaa
- kahukärpäsen toukka
- sienitauteja
- talvihomesieniä

- rikkakasveissa keskitytään lähinnä voikukkatorjuntaan pääasiassa karheikkoalueilla ja pistekohtaisesti muuallakin
- apilaa vioitetaan pieni/matala kasvuseksi ainoastaan karheikoilla ja torjutaan vain esiintymiä 1-2 ruiskutuskerralla kauden aikana
- kahukärpäsen toukkaa torjutaan ruiskuttamalla normaalisti kerran kauden aikana
- sienitautien torjunta: (härmät, ruosteet, noki, laikkutaudit) ruiskutetaan keväällä (toukokuu) ja elo-syyskuussa
- talvihomesienten torjunta alkaa syksyllä ja jatkuu lumen tuloon saakka - raudan käytöllä syksyllä on voitu pienentää talvihomesienten kemikaalisia ruiskutusmääriä
- kaudella -97 tullaan kokeilemaan inhibitoreita, mikä on luonnonmukainen torjunta homesieniä vastaan

3.5. Torjunta-aineiden käyttösuositukset

- torjunta-aineita käytetään vain todetun tarpeen mukaan
- kaikessa torjunnassa huomioidaan vesistösuojelu
- torjuntakalusto on oltava koko ajan kunnossa ja valmiina
- siirrytään asteittain yhä enemmän biologiseen torjuntaan
- terve kasvusto kestää taudit myös paremmin
- käsittelijöillä on oltava torjunta-aine käyttötiedotteet saatavilla
- ilmoitus kentän käyttäjille mitä torjuttu ja millä (varoitusta kaula-alueen, nivusten ja silmien hieronta)

3.6. Kastelun järjestäminen

- järjestelmä
- kastelun tarve
- veden riittävyys
- kapillaariveden hyödyntäminen

4(8)

Nordgolfiin molemmilla kentillä on oma kastelujärjestelmänsä.

Freem-kentän satelliittiohjauksella varustettu kastelujärjestelmä antaa ohjatusti 503: n maahanasetetun pop-up sadetimen kautta, pumppaamo on rakennettu väylä 17 kasteluaitalle ja sen korko on 1/3 kentän kokonaiskorosta (54 m). Kenttää voidaan yön kymmenen kastelutunnin aikana kastella yhteensä n. 1050 m³ (kokonaiskastelutarve aniharvoin).

Benz-kentän tietokoneohjattu kastelujärjestelmä antaa ohjatusti vettä 972:n pop-up sadetimen kautta. Pumppaamo on rakennettu väylien 9 - 18 välissä olevan kasteluvesialtaan rannalle. Kenttää voidaan yön kymmenen kastelutunnin aikana kastella yhteensä n. 2000 m³. Maksimitarvetta joudutaan käyttämään tuskin koskaan. Periaatteessa koko Benz-kenttä on kastelun saavutettavissa.

3.7. Kastelun tarve

Koska Nordgolfiin molemmat kentät on rakennettu hiekkaturveseosta kasvualustana käyttäen, on kastelu kentillä erittäin tärkeä ja sadetismääriltään tarkka. Kuumina kesäpäivinä joudutaan keskellä päivää antamaan ruoholle niinsanottu jäähdytyskastelu.

Kasteltaessa on otettava huomioon veden riittävä saanti kasvukerrokseen kuitenkin huuhtomatta ravinteita. Kasvukerros kastellaan riittävän syvältä ja annetaan säästä riippuen kasvin käyttää kapillaarivettä, tällöin myös kasvi hakee juurensa syvemmälle ja siitä tulee kestävämpi. Kastelussa on varottava jokaioista pintakastelua.

3.8. Veden riittävyys

Kasteluveden riittävyys molemmilla kentillä on ratkaistu Mustionjokeen rakennetuilla kahdella siirtopumppaamolla, jotka vuorokauden aikana pystyvät siirtämään kasteluaitaisiin sen määrän jokivettä, mitä kymmenen yötunnin aikana kasteluun tarvitaan. Tällä estetään kastelulampien vedenpinnan suuret heittelyt.

3.9. Kasteluedet ja ravinteet takaisin kiertoon

Freem-kentän rakennustöiden alkaessa tiedettiin jo Pohjanpitäjänlahden herkkyys reagoida typpi- ja fosforipäästöihin. Kentän valumavedet ovat joko, järjestetty kastelujärjestelmän kautta uudelleen kiertoon, suodattu metsäalueille tai se osa vesistä, joka päättyy Pohjanpitäjänlahteen, puhdistetaan (sakkaus tai ilmaan kasvien kautta) useammissa saostuslammissa, joihin vesi ohjataan rauhoittumaan. Joissa olevat rehevät kasvit käyttävät ravinteita runsaasti ja niiden puhdas kirkastunut pintavesi päästetään seuraavaan vastaavaan puhdistusoperaatioon. Tällä menetelmällä on saatu loistavia tuloksia (oman tarkkailumme lisäksi). Liitteenä Länsi-Uudenmaan vesi ja ympäristö ry:n ja VTT:n tekemä puolueeton Nordgolfiin golfkentän pintavesien tarkkailututkimus.

Benz-kentän valumavedet suodattuvat metsä alueelle lukuunottamatta kasteluallasta, jossa ylijuuksutus minimoidaan, ja vesi otetaan mahdollisine ravinteineen uudelleen kiertoon, viittaus tutkimukseen kohta 3.

3.10. Jätehuolto

1994 jätelaki ja asetus:

- haltijan oltava selvillä määrästä, laadusta ja ominaisuuksista
- erillaiset jätteet pidettävä erillään
- ei saa aiheuttaa ongelmia ympäristölle, eikä terveysvaaraa
- ongelmajätteet lajiteltava
- jätteen keräys järjestettävä

Nordgolfilla on jätehuoltosopimus Karjaan jätehuollon kanssa.

Normaalista jätelaatikkojätteestä seuraavat ongelmajätteet lajitellaan jo alueella niille jokaisella erikseen varattuun jätteastiaan:

- jäteöljy
- liuottimet
- akut
- paristot
- öljysuodattimet ja kiinteä öljyjäte
- loisteputket

Näin lajittelusta koituu myös huomattava rahallinen säästö.

Jätehuollossa noudatetaan SGL:n ympäristöohjelmassa laadittuja ohjeita.

4. GOLFKENTÄN TURVALLISUUS

4.1. Työturvallisuus

Työturvallisuus on olosuhteiden tila jossa työ ja työolot eivät sisällä mitään työntekijän terveyteen, turvallisuuteen tai viihtyvyyteen kohdistuvia vaara-, rasitus- tai haittatekijöitä.

Työsuojelulla pyritään parantamaan kaikkia työturvallisuuteen liittyviä riskitekijöitä.

Seuraavat vaaratekijät ovat työntekijälle vaarallisimmat:

- koneet ja laitteet
- rakennukset
- kemialliset aineet
- harhautuneet golfpallot

Työhön opastaminen ja työturvallisuuteen perehdyttäminen parantaa merkittävästi työturvallisuutta. Näitä toimenpiteitä ovat:

- uusien työntekijöiden perehdyttäminen turvalliseen työtapaan
- perehdyttäminen uusiin laitteisiin ja niiden turvalliseen käyttöön
- työsuojainten käyttöohjeiden noudattaminen
- työsuojeluohjeiden noudattaminen

Kemiallisia aineita on kentän hoidossa käytettävä vain pakottavissa tapauksissa ja silloinkin niille altistumisvaaraa on voitava tehokkaasti vähentää käyttämällä ohjeiden mukaista suojausta- ja suojaimia.

4.2. Nordgolfin toiminnassa noudatettavat lait

Työturvallisuuslaki 28.6.1958/299
 Työterveyshuoltolaki 29.9.1978/743
 Tapaturmavakuutuslaki 20.8.1940/608
 Laki nuorten työntekijöiden suojelusta 29.12.1967/669
 Asetus työministeriöstä 12.5.1989/437, " 2,5 ja 5"
 Laki työsuojeluhallinnosta 8.1.1993/16

4.3. Turvallinen pelaaminen

Golfkenttä on:

- pelaajille vapaa-ajan harrastuspaikka
- muille liikkujille ulkoilualue
- kentän henkilökunnalle työpaikka

Kaikki ryhmät on otettu huomioon Nordgolfin kenttien suunnittelussa. Golfetiketti ja sen tinkimätön noudattaminen sekä oikea informaatio tekevät pelaamisesta turvallisen. Muiden ulkoilijoiden reitit on suunnattu viitoituksilla, liikkumiskielloilla ja erilaisilla istutuksilla ja näin suunnattu pois vaarallisilta alueilta.

5. KENTÄN YMPÄRIVUOTINEN KÄYTTÖ

Kausi joka Nordgolfissa kestää yleensä n. 200 vrk on pääasiassa pelaajien hyödyntämä. Syksyisin marjastajat ja sienestäjät liikkuvat kentän ulkopuolisilla metsä- ja viheralueilla. Pelikierroksia on ennakoitu vuotena 1995 olevan n. 25.000 ja joka vuosi tasaisesti lisääntyvän 10-15 % vuosivauhdilla.

Ulkoilijoiden liikkuminen oikealla tiedottamisella on heidän oman turvallisuutensa vuoksi rajoitettava kentällä ja sen lähialueilla minimiin. Lentävän pallon iskuvoima on yllättävän suuri ja pallon osuminen ulkoilijaan tai toiseen pelaajaan äärettömän vaarallinen.

5.1. Nordgolfin alueen käyttö muuhun liikuntaan

Alueemme on poikkeuksellisen kaunis ja tarkoitettu ympärivuotiseen virkistyskäyttöön sopivaksi ulkoilualueeksi. Nordgolf onkin panostanut alueellaan olevan monipuolisen eläimistön ja kasvikkunnan kehittämisen siten, että se saumattomasti liittyy korkeatasoiseen kulttuurimiljöömme.

5.2. Pelikausi

Pelikaudella toiminnan painopiste on kenttien hyvän kunnon ylläpitäminen. Keväisin kentillämme voi tavata "lintubongaajia", kalastajia ja muita ulkoilijoita. Syksyisin alueeltamme löytyy myös sienestäjiä ja marjastajia. Oikealla tiedottamisella ja asiallisella vuorovaikutuksella ja kanssakäymisellä muodostetaan ympäristö josta kaikki osapuolet pääsevät nauttimaan, osakkeenomistajien oikeuksista tinkimättä. Leikkipuisto hoitotäiteineen täydentää kokonaisuutta.

5.3. Talvikausi

Talvikausi on Nordgolfin perinteiden mukaan myöskin tapahtumarikas. Alueellemme rakennetaan lumiolosuhteiden niin salliessa:

- luistinrata/radat
- murtomaahiihtoladut
- curlingrata
- lapsille pulkkamäki

Talvigolfareille kunnostetaan autolato talviharjoittelulaksi. Talvisin pyritään hauskuutta ja harrastemahdollisuutta lisäämään liukkaan kelin harjoitusradalla, jossa ajaminen tapahtuu golfautoilla.

5.4. Yhteistyö

Nordgolf on huomioonottanut toiminnassaan ympäristön asukkaat ja ulkoilijat jotka kentillämme liikkessaan samalla valvovat ettei kentillämme tapahdu tarpeetonta ilkeävaltaa tai varkauksia. Tämä takaa myös sen, että ruohokasvustoon kohdistuva rasitus jää mahdollisimman pieneksi.

6. YHTEENVETO

6.1. Nordgolfin johtavat periaatteet ovat seuraavat:

1. Laadullisesti korkeatasoinen ympäristö rikastaa golfin pelaamista.
2. Ympäristösuojelutavoitteet ovat tärkeitä osatekijöitä kentän toiminnan johtamisessa.
3. Vastuu ympäristöstä edesauttaa taloudellista onnistumista.

Ympäristöperiaatteiden tavoitteena on tuottaa hyötyä kaikille osapuolille ja osoittaa golfkentän ja ympäristönsuojelun intressien olevan yhteneväiset.

6.2. Tutkimustoiminta

Nordgolf seuraa tarkasti alan kehitystä ja omien kenttensä kehittämismahdollisuuksia lannoitteiden ja torjunta-aineiden oikeaoppisessa käytössä yhteistyössä viranomaisten kanssa. Nordgolf tekee ympäristönsuojeluun lisäämiseen liittyviä projekteja sekä omalla toiminnallaan myötävaikuttaa ympäristönsuojelun tavoitteiden pitkän aikavälin toteutuksissa.

Kaikessa rakentamistoiminnassaan, golfin pelaamiseen liittyvien tavoitteiden ohella, Nordgolf asettaa etusijalle luonnon monimuotoisuuden säilyttämisen ja mahdollisuuksiensa mukaan sen lisäämisen. Tulevaisuudessa eri tutkimusten ja tarkastusten yhteydessä kartoitetaan alueen harvinaiset eliöyhteisöt ja rauhoitusalueet ja laaditaan suunnitelma näiden säilyttämiseksi.

Tehdyt tutkimukset ovat osoittaneet, että huolellinen kentänhoito on luonnon monimuotoisuutta lisäävä tekijä eikä kentänhoito kuormita ympäristöä.

6.3. Nordgolfin kenttienhoito

Nordgolf on Siilinjärveläisen golfkentän ohella suomalaisen golfkenttätutkimuksen edelläkävijä. Nordgolf on jo vuodesta 1987 käyttänyt määrääjain toistettuja viljavuustutkimuksia noudattaakseen oikeaksi todettuja hyviä viljelymenetelmiä.

Näihin kuuluvat:

- tarkistuksenmukaiset nurmeseosten kylvöt
- suojavähykkeiden hyödyntäminen vesialueiden varsilla
- lannoitteiden ohjeellisten enimmäismäärien noudattaminen kenttien eri osilla
- kemiallisia torjuntamenetelmiä on vältettävä, mutta mikäli niihin joudutaan on se tehtävä varomääräyksiä noudattavan ja siihen koulutetun henkilökunnan toimesta, käyttökerroista ja -määristä pidetään kirjaa
- torjunta-aineiden käyttö on oikea-aikaistettava
- levityskaluston on oltava käyttöasteeltaan moitteeton
- oikeaoppiseen varastointiin on kiinnitettävä riittävästi huomiota

Kasvukauden sateet kuuluvat olennaisesti kentän kastelutarpeeseen. Vaikka Nordgolfin kastelujärjestelmät ovat parhaimmat alallaan, on kasteluveden käytön perustuttava kasvien vedentarpeeseen, jolloin vältytään tarpeettomilta lannoite- ja torjunta-ainehuuhtoutumilta.

7. LOPUKSI

Kenttäalueen ja maiseman vaaliminen ja elvyttäminen on eräs golfkentän hoitoon liittyviä tehtäviä. Pitkäjänteinen suunnittelu puuston uusimiseksi sekä kentän peruseräparannukseksi on tehtävä suunniteltujen talousarvioiden puitteissa. Suuret muutostyöt on huolellisesti suunniteltava niin maisemallisesti kuin taloudellisesti. Tämä edellyttää KTS-suunnitelman laatimista.

Tämä ohjelma ottaa huomioon luonnon- ja ympäristösuojelun.

Nordgolfin kenttien sijaitessa lisäksi arvokkaassa kulttuurimiljöössä sekä vesistösuojelliset näkökohdat huomioonottaen arvokkaan Pohjanpitäjänlahden rannalla on ympäristönsuojeluun kiinnitettävä erityinen huomio.

Monimuotoinen eläimistö sekä huolella vaalittu maisema lisäävät koko golfimagon tunnetuksi tekemistä positiivisessa mielessä, ennenkaikkea se edesauttaa pelin viihtyvyyttä sekä nostaa golfkeskuksemme arvoa.

Nordgolf tulee kehittämään ympäristöohjelmaansa yhteistyössä SGL:n, viranomaisten sekä asiasta kiinnostuneiden tahojen kanssa. Nordgolf tukee kaikkia tutkimuksia jolla kentänhoitoa kehitetään sekä seuraa alan kehitystä ottamalla huomioon muuttuvat ympäristönsuojelun tarpeet.