

# Benefits of Outdoor Recreation and Access to Nature

– a review of current evidence  
of added value



## Preface

This report summarizes the effects of outdoor recreation and exposure to nature on health, public health and other benefits for society. The two areas are naturally interlinked because outdoor recreation requires access to recreation areas and nature, and people engaged in outdoor recreation thus have a great interest in the preservation and development of such areas. The report is based on current scientific evidence and relies primarily on systematic reviews of studies that have undergone peer reviewed processes as well as reports from established organizations such as the WHO. The published studies derives from many different countries, but with a preponderance of English speaking countries. The number of Swedish published studies is relatively low, but increasing. The studies are conducted by many different research groups and in different contexts with similar results, which is generally an advantage for assessing the relevance of the results.

Naturally, outdoor recreation has a number of intrinsic values for individuals, such as joy, relaxation and excitement, but this report focuses on the overall effects on society. The report is based on two assumptions; Firstly, regular outdoor activities have the same effects as regular physical activity and, secondly, outdoor recreation involves exposure to nature. The report is thus based on significant research on the effects and outcomes of physical activity and contact with nature. The number of studies that specifically examined the effects of outdoor recreation on health and public health is relatively low and there is a need for more and better designed studies to strengthen the knowledge base. A third assumption is that research conducted in other countries also has relevance in a Swedish context. However, the reader should be aware that there may be cultural differences between countries that affect the results and make relevance difficult to assess in a Swedish context. The report is written by Johan Faskunger, PhD in Physical Activity and Public Health, at Svenskt Friluftsliv (Swedish Association of Outdoor Organizations), and it is an update of our previous publication in 2020. The report can be downloaded from our website [www.svensktfriluftsliv.se](http://www.svensktfriluftsliv.se). The page also contains an extensive summary of the report's conclusions. The report is mainly based on research published from about 2005 until December 2022. The next update of the report will take place in January 2024.

## Contact:

Svenskt Friluftsliv, Johannesfredsvägen 7, Bromma, Sweden  
[info@svensktfriluftsliv.se](mailto:info@svensktfriluftsliv.se) [www.svensktfriluftsliv.se](http://www.svensktfriluftsliv.se)

© Svenskt Friluftsliv 2023

## Table of Contents

1. Summary.....	4
2. Outdoor Recreation, Health and Public Health.....	6
Physical Health	
Mental Health	
Social Effects	
Effects of Organised Outdoor Activities	
3. Outdoor recreation, Finance and Health economics.....	17
Introduction	
Private Economy	
Health Economics	
Effects on Children, Adults and Elderly	
Local and Regional Economy	
National Economy	
4. Outdoor recreation, Nature and Environment.....	26
Introduction	
The Effects of Outdoor Recreation on Nature and Environment	
Noise	
Pollution	
Heat	
Flooding	
5. Outdoor Recreation and Environmental Awareness.....	31
Introduction	
The Effects on Adults	
The Effects on Children	
6. Outdoor Recreation, Social inclusion and Equity .....	33
Introduction	
Effects on Integration	
Good Examples	
7. Outdoor Recreation, Outdoor Pedagogy, Learning and Development .....	40
Introduction	
Outdoor Recreation and Learning	
The Effects of "Green"/Nature Education	
The Effects of Organized Outdoor Recreation on Learning and Health	
8. Effects on Health and Well-being of Access to Nature and Recreation areas.....	46
Introduction	
Access and Proximity to Recreation Areas	
Effects on Children	
The Role of Local governments to Promote Recreation Areas and Nature	
9. References.....	50
10. Appendix: List of Systematic Reviews on Outdoor Pedagogy, Outdoor Recreation on Learning and Development.....	63

## 1. Summary

An overall assessment of research indicates that outdoor recreation activities (Swedish: friluftsliv) and access to recreation areas/nature leads to positive effects on physical, mental and social health factors in the population, as well as on learning and development, including for children, and factors related to sustainable development in society. Outdoor recreation involves contact with nature and leads to increased physical activity, which positively affects different aspects of health, development and learning. Outdoor recreation and access to recreation areas are also important to promote more equal conditions for health development, physical activity, public health as well as to sustainable development in society. Recreation areas and nature also generate significant ecosystem services.

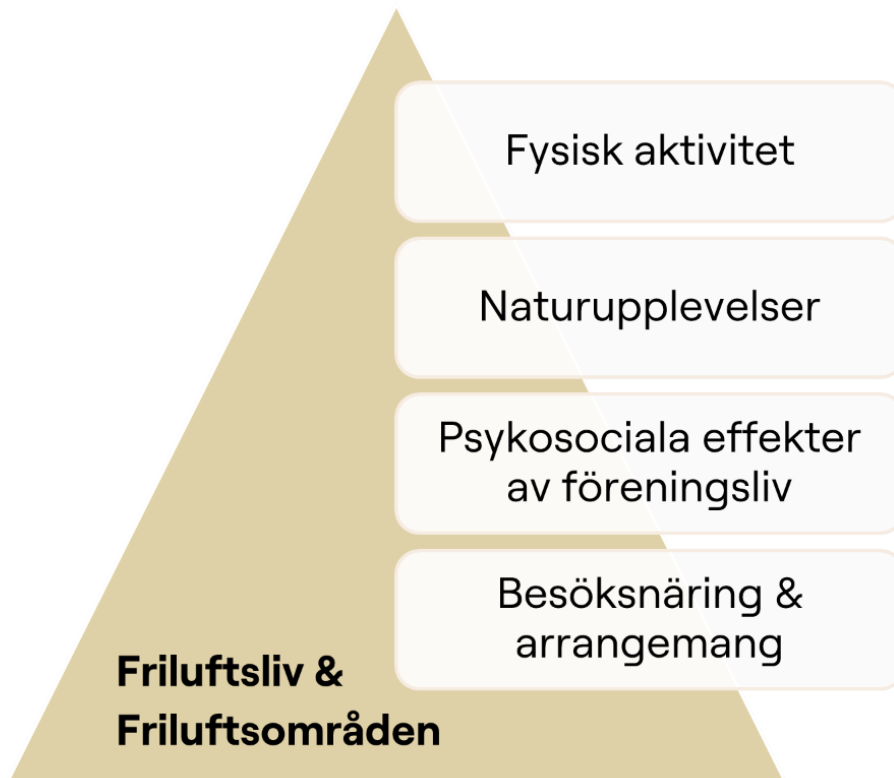
Outdoor recreation, recreation areas and being outdoors play extraordinarily important roles in counteracting a sedentary lifestyle, bad health and becoming a societal burden on society. A new study reveals that a sedentary lifestyle can cost up to SEK 90 billion per year in Sweden, independent of the costs of overweight and obesity. Efforts to increase physical activity, for example through outdoor recreation, are generally cost-effective and inexpensive: An invested SEK 1 generates almost 4 crowns in social and economic values in return. Society can save large amounts each year by activating more people, for example by providing good opportunities for outdoor organizations to conduct activities and reach more people. From a health economic perspective, it is especially important to reach more adults and the elderly.

Participating in organized outdoor activities can have a wide range of positive effects beyond the intrinsic value for the individual, for example promoting meaningful leisure time, reducing the propensity for young people to commit crimes, developing environmental awareness among children, promoting knowledge of democratic processes and contributing to better public health. In the school setting, outdoor education with elements of physical activity and contact with nature has a number of positive effects, such as improved learning, memory, concentration and school performance – including theoretical subjects. Additionally, outdoor education and regular contact with nature provides protective factors against mental illness.

Outdoor recreation, including access to recreation areas, can stimulate the local economy, generate jobs and stimulate tourism industry. The unique opportunities to take part in outdoor recreation and visit nature are some of the most common reasons for tourism in Sweden.

Proximity and accessibility to outdoor recreation areas and other 'green' and 'blue' environments is a very important piece of the puzzle in creating sustainable, attractive and movement-promoting cities and towns.

Figure 1. Model of overall added value and societal benefits of outdoor recreation and access to recreation areas. Friluftsliv = Outdoor recreation. Friluftsområden = recreational areas. Fysisk aktivitet = Physical activity. Naturupplevelser: Exposure to and experience of nature. Psykosociala effekter av föreningsliv = Psycho-social effects of participating in organised outdoor recreation. Besöksnäring & arrangemang = events, local/regional development, nature-based tourism.



## 2. Outdoor Recreation, Health and Public Health

### Recommendations

Previously, there has been a lack of knowledge and guidelines on the amount of time in nature needed to promote general health and well-being. However, recent research from the UK based on 20,000 participants (White et al, 2019) shows that the optimal level of exposure to nature on self-reported perceived health and well-being corresponds to 3–5 hours a week or around 25–45 minutes per day. It did not matter if the exposure was on one or more occasions. The association was equally strong for all studied groups, including the elderly and people who reported long-term illness. Thus, the recommended level of physical activity and exposure to nature for health and well-being are similar.

### Effects on physical health

The current knowledge base shows that outdoor activities that involve regular physical activity and contact with nature, lead to significant and powerful effects on physical health, for example by increasing fitness, increasing muscle strength, improving bone health, counteracting cardiovascular disease, high blood pressure and type 2 diabetes. Furthermore, outdoor recreation can improve motor skills (Eigenschenk et al., 2019; WHO, 2016). Good motor skills are a basic prerequisite to be able to engage in outdoor recreation and to live a physically active life, and many outdoor activities have good potential to promote motor skills.

Regular physical activity and outdoor activities prevent a wide range of our most serious endemic diseases, which mainly affect middle-aged and older people, while many hours of sitting still every day increase the risk of premature death and developing chronic diseases. Examples are type II diabetes, high blood lipids, high blood pressure, overweight and obesity, osteoporosis and cardiovascular diseases. Even shorter visits to recreation areas have effects on health: Heart rate, blood pressure and stress hormones in the blood decrease during stays in nature (WHO, 2016). Spending time regularly in the outdoors can also reduce the risk of acute urinary tract infections, intestinal infections, migraines, asthma and dizziness (Kuo, 2015). Outdoor recreation also promotes, among other things, fitness (if the activity is sufficiently physically strenuous), balance, coordination, quality of life and strengthens muscles, joints and bones.



Too much sitting and lack of physical activity and exercise is estimated to contribute to about 6 million deaths worldwide each year. The corresponding figure in Europe is 1 million per year, of which about 10,000 in Sweden. Sedentary lifestyles cause losses of over 20 million healthy life years in the world every year (WHO, 2022). Sedentary behaviour is the fourth largest risk factor for premature death and disease burden in society. Sedentary people have twice the risk of cardiovascular disease compared to people who are regularly physically active and sit relatively little (Faskunger, 2013; Malm & Isaksson, 2017). Average life expectancy in Europe would increase by 0.63 years if sedentary lifestyle was completely avoided, and if all people in the region met the physical activity guidelines (Lee et al., 2012).

Regular physical activity and outdoor activities reduce the risk of premature death by 30 percent in humans in general, lower the risk of cardiovascular disease by 20–35 percent, lower the risk of metabolic syndrome and diabetes by 30–40 percent, the risk of colon cancer by 30 percent, that of breast cancer by 20 percent hip fractures by 36–38 percent, that of depression by 20–30 percent, dementia by 20–30 percent and mental illness by 20–30 percent. The risk of suffering from back problems is also significantly lower in the physically active, 30 percent lower than for non-active people. In the elderly, the risk of premature death is 44 percent lower in the physically active compared to groups with a sedentary lifestyle.

Physical activity and outdoor activities improve insulin sensitivity, motor skills and coordination, muscle strength, balance, body composition, bone health. It gives increased fitness, better blood fat profiles, improved immune system, better learning, working memory and cognitive abilities, better gut health, better sleep, better eating habits and reduced risk of overweight and obesity.

Furthermore, there is a link between regular physical activity and a reduced risk of developing dementia in adults and the elderly.

Recent research has also examined the effect on visual health and eating habits in children by being in outdoor environments: The risk of developing myopia in children decreases with increasing outdoor stays, according to a recently published systematic review. The risk of myopia decreases when children are outdoors because the eyes are trained to focus on objects and events both near and far away (Cuo et al., 2020). Furthermore, children who spend a lot of time outdoors have better eating habits than children who spend more time indoors in general, independent of other known risk factors (Chaput et al., 2018). Why children develop better eating habits with an outdoor lifestyle is not fully understood. One hypothesis is that children with an outdoor lifestyle spend less time indoors, and research shows that staying indoors increases the risk of unhealthy eating habits and consumption of energy rich foods and drinks.

Improved sleep by increased physical activity and outdoor recreation is a well-established scientific fact. However, the impact of improved sleep patterns on other areas of public health has not been discussed and paid as much attention to in the past. In recent years, however, more and more scientists and public health officials have pointed out the important role of good sleep, in preventing fatalities and injuries on the roads, as fatigue is one of the most common causes of – or contributors to – car crashes, serious injuries and road fatalities.

Another important health effect of outdoor recreation is exposure to sunlight and the storage of vitamin D in the body – even in wintertime. Sunlight is our most important source of vitamin D, which is important for health and well-being. Vitamin D is especially important to promote good bone health, to counteract osteoporosis, promote cognitive ability and improve sleep quality in humans (WHO, 2016). Vitamin D also seems to reduce the risk of developing multiple sclerosis, MS (Manferdelli et al., 2019).

## Effects on mental health

The research base indicates that the positive psychological effects of spending time outdoors and engaging in outdoor activities are at least as tangible as the physical ones (e.g. WHO, 2016; Keniger et al., 2013; Lackey, 2019), while the spiritual effects have not been examined to the same extent (Keniger et al., 2013). Almost all evaluations indicate positive mental effects of exposure to nature and engaging in outdoor recreation, and almost no study points out any negative results (Lackey, 2019). However, there is a need for more high-quality research in the area (Lackey, 2019; Social & Health Impact Center, 2022).

It is also well established that spending time in nature increases people's ability to recover from illnesses and to cope with stress (Berto, 2014; WHO, 2016). Programs that use visits to nature in the treatment of people with



psychiatric diagnoses generally give good results on a wide range of outcomes, such as perceived meaningfulness, recovery from illness, well-being and stress management. The environment is also perceived as a safe and secure place by participants (Picton et al., 2020). There are also some promising and positive results from a Swedish programme, Friluftsförbundet's (Region South) project Häng med oss ut! (Join us outdoors!) who used outdoor recreation and nature to treat patients with psychiatric diagnoses (Ståhl et al., 2021). Outdoor recreation in "green" and "blue" environments may have even greater mental health effects compared to physical activity performed in urban/"grey" environments or in programmes taking place indoors (Thompson Coon et al., 2011), for example through increased recovery, reduced stress and reduced risk of mental illness, depression and increased mental stability (Abraham et al., 2010; WHO, 2016; Lackey et al., 2019; Eigenschenk et al., 2019). A systematic review published in 2022 has compiled research on the psychological effects in adults of being physically active in green/natural environments compared to grey/ built environments. The review included 24 original studies and nine results were also included in a meta-analysis. The review showed that, although all evaluations using physical activity had positive effects on various measures of mental health, programmes focusing on natural environments had significantly stronger effects on participants. Physical activity in natural environments was associated with lower incidence of anxiety, exhaustion, aggressiveness and higher incidence of vitality, energy and affect. Programmes and interventions in natural environments also had a slightly increased impact on counteracting depression compared to other interventions based in built/grey environments or indoors (Wicks et al., 2022).

McMahan et al. (2015) found in their meta-analysis that spending time in outdoor recreation areas had strong positive effects on mood and counteracted negative moods in participants. Positive effects of spending time in outdoor recreation areas have been seen in a wide range of different groups, for example in people with autism, in people diagnosed with ADHD, adolescents who have committed crimes, people with behavioral problems, pregnant women, in the elderly, groups with different functional variations and in groups without functional variations (WHO, 2016). Access and exposure to nature is very important for children's development. Furthermore, access to nature is clearly linked to mental health, cognitive development, concentration, lower risk of ADHD and higher school performance in children.

Another studied group concerns women. Pregnant women can significantly lower their blood pressure and risk of depression by spending time in recreation areas, and the association is strongest for women with poor socioeconomic backgrounds (WHO, 2016; Banay et al., 2017). The fact that women with poor socioeconomics experienced the greatest effect of increased contact with nature, is believed to be related to the fact that they

had, among other things, the lowest contact with nature at the start of the program.

Two Swedish studies with long follow-up time showed that regular exposure/visits to quiet, aesthetically attractive and perceived safe green spaces significantly reduced the risk of future mental ill-health in women (Annerstedt et al., 2012; Van den Bosch et al., 2015). Groups with large regular contact with nature perceived greater life satisfaction and experienced more vitality compared to groups with a lower degree of contact with nature, regardless of other factors such as socioeconomics, level of education and place of residence (Capaldi et al., 2014).

Many clinicians/professionals of the healthcare sector have stressed the potential and importance of outdoor recreation and exposure to nature, for rehabilitation and prevention. A recently published systematic review (Lakhani et al., 2019) found evidence that regular gardening and spending time in gardens is very positive for patients with dementia, brain damage and stroke, especially positive for their psychosocial health development. Physical activity in green environments improved both self-esteem and mood in both male and female participants according to a systematic review by Barton & Petty (2010). The greatest improvement was shown in participants with a diagnosis related to mental illness. Although the impact of outdoor recreation decreased after the end of the programmes, there were still some positive effects evident in the long term follow-up.

The Swedish Environmental Protection Agency (2006) has published a report – Nature as a Source of Power – on nature's positive impact on the healing process of hospital patients. The report cites research that patients who are prescribed visits in nature or who are able to spend time in nature recover faster, need less pain relief treatment, and have less headache and stomach pain, compared to other patients.

Children's physical activity, play and cognitive ability are all promoted by spending time in recreation areas (Dankiw et al. (2020) – these relationships are further addressed in the chapter on learning. The importance of outdoor recreation areas and exposure to nature seems to be very important for the mental health development of children and young people, in addition to encouraging play and physical activity: A recent Danish study of almost one million children, showed that a high proportion of greenery in the residential area during childhood significantly lowered the risk of mental disorders and diseases in adulthood. Children who grew up in areas with the lowest proportion of greenery had a 55 percent higher risk of mental disorders and diseases compared to children who grew up in areas with the highest proportion of green



surroundings. The association remained even when checked for other known risk factors, for example socioeconomic background, degree of urban environment in the place of residence and previous family history of mental illness. The longer the children lived in the greenest residential areas, the lower the risk of future mental illness. (Engemann et al., 2019).

In young children, (before school age; 2–6 years), there is a clear correlation between being outdoors and high levels of physical activity as well as good sleep, while high use of various digital screens impairs sleep, at those ages, according to a recently published systematic review (Janssen et al, 2020). The use of digital screens usually takes place indoors and almost always means a higher likelihood of a sedentary lifestyle in both children and adults. Spending time in outdoor recreation areas and parks is strongly associated with perceived meaningfulness and self-rated health, and seems to positively affect aspects related to spiritual health, even though the number of studies/evaluations in this area is relatively small. Examples of factors related to spiritual health: perceived inspiration, sense of coherence and contact with reality, feelings of admiration, respect, and responsibility for nature (Keniger et al., 2013). In the survey for the Swedish research program Outdoor Life in Change (“Friluftsliv i förändring”; Swedish Environmental Protection Agency, 2013), as many as 90 percent of the participants stated that spending time in recreation areas and other green spaces makes their everyday life more meaningful and affects their health status positively. The Swedish population strongly believes that their health status would be greatly impaired if the opportunity to visit recreation areas would suddenly disappear. The median value for self-rated would decrease from 80 to 50 on a scale of 0–100 if the participants would not have the opportunity to engage in outdoor activities and visit nature (Swedish Environmental Protection Agency, 2013). A reduction from 80 to 50 is a significant and distinct deterioration in self-rated health.

A common form of outdoor recreation is family based activities. Family based outdoor recreation can have positive effects on health and well-being in participants by promoting competences, learning, strengthening family members' identity, recovery from stresses and improving cohesion, according to a systematic review from 2018 (Kay et al, 2018). Family-based recreation can also offer a break from everyday pressures and commitments, and people can learn new skills in a safe environment according to the review.

*Family-oriented outdoor recreation can lead to positive effects on health and well-being by promoting competences, learning, strengthening family members' identity, recovery and cohesion*

## Effects on social health

The social effects of outdoor recreation are also important to highlight. The area is not as researched as the physical and mental effects of physical activity and outdoor recreation, however. Both organized and self-organized (spontaneous) outdoor recreation can potentially promote a meaningful social existence, build bridges across generational boundaries and be an important motivator for physical activity.

Organized outdoor activities can lead to a climate in which participants learn to cooperate and to set goals, to deal with both ups and downs and resolve conflicts, to get an outlet for emotions and test boundaries, generalizing the results of studies performed within sports movement. There have been a number of Swedish studies on participation in sports on the above outcomes (e.g. Wagnsson, 2009; Wagnsson & Augustsson, 2015). Participation in organized outdoor activities can also possibly prevent negative behaviour in young people, for example fights and crime. Young people involved in sports are also more likely to have a lower consumption of alcohol, tobacco and drugs, when compared to peers. Such results have been reported in studies involving participants in organized sports in Sweden, consistent with results from international studies. Positive leisure activities and organized outdoor recreation in young people reduce the risk of crime and mental illness, while a sedentary lifestyle increases the risk of mental illness, according to a Swedish review. The review also found that nature and green surroundings in the residential area and outdoor education in schools were protective factors against mental illness (Social & Health Impact Center, 2022). In England, studies have shown that participation in physical activity and sport activities reduces the risk of criminal activities by around one percent in young men (Sheffield Hallam University, 2021). Although a one percent reduction may seem small, it should be noted that physical activity and outdoor activities most likely can be used together with other measures to produce greater impacts.

A positive effect from organized outdoor recreation on social capital is also possible. In sports settings, such effects have been documented. Participation in sports is associated with higher social capital through a ten percent increase in social networks, perceived trust and sense of belonging in youth participants, according to a study from Australia (Gratton et al., 2015).

Organized outdoor recreation or outdoor recreation-like programs also seem to have positive effects on mental and psychosocial health for different groups. Stott (2013) compiled the effects of naturebased adventure expeditions in older adolescents and young adults through a systematic review based on 35 original studies. The adventure expeditions led to the participants experiencing personal development, improved self-confidence, increased physical and social stability, increased self-awareness and self-reflection and improved social skills. The programmes also led to the development of participants' ability to cope with challenges and to overcome difficulties (resilience or grit). The programmes increased participants' environmental knowledge, environmental awareness and appreciation of nature.

Additionally, organized outdoor recreation is likely to have many positive social effects and other added values for the participants since the movement is one of Sweden's largest with 1.8 million members in 27 different organizations. If the activities were not perceived as socially beneficial and meaningful, most people would probably not enroll or stay on as members.

An evaluation of the activities of the International Scout Movement found that participants in scouting experienced higher personal control, had stronger empathy and respect for others, experienced higher levels of meaningfulness in life, and a sense of being part of a global context, compared to non-participants. The differences between the groups were 6–20 percent depending on outcome (World Organization of the Scout Movement, 2019). In addition, participants reported an 18 percent higher level of physical activity, compared to non-participants. However, it is important to note that outdoor activities and programs need to be based on this focus, to create the right conditions to help achieve such goals – it does not necessarily happen automatically. In comparison, physical activity can promote bodily balance, but activities that actually include balance and strength exercises will be the most effective. At the same time, participation in the association and board work of non-profit organizations can entail and promote 'education' in principles of democracy, influence/participation and increased understanding of civil rights. This type of activity also needs to be designed with such objectives in mind, in order for them to actually take place.

The relationships between, on one hand, good social relations and health/well-being and, on the other hand, social isolation and ill health/disease are scientifically well established. Good social relationships

are strongly associated with better health and well-being, at the same time as a high degree of social isolation is associated with an increased risk of ill health and disease.

There are many indications that the prevalence of mental illness is higher in populations living in cities than in rural areas (Folkhälsodata, Folkhälsomyndigheten). Increasing urbanization in society has, among other things, led to increased social isolation in society. Recreation areas can promote good social relations, increase social capital, increase community cohesion, and reduce social isolation, both in terms of access and in terms of quality and design of areas (Keniger et al., 2013; WHO, 2016; Wray et al., 2020). Recreation areas and nature in residential locations probably play an especially important role in promoting social relationships, as these areas are visited more frequently by people than rural areas. Outdoor recreation areas and parks also have greater potential for larger groups to meet and interact, and different activities can normally take place simultaneously thanks to larger spaces available compared to most indoor environments (Keniger et al., 2013; Tidball & Krasny, 2014).

Older people are also more integrated and involved in their local environment if there are recreation areas and parks present (WHO, 2016). Among children, there is a correlation between access to residential outdoor/green areas with playgrounds and other play areas and good social relationships. However, not many studies have investigated whether this association also applies to adolescents (Wray et al., 2020).

There is also some evidence that green areas and a high proportion of greenery can reduce crime, violence and aggressive behaviour in residential areas (Keniger et al., 2013), but the evidence is somewhat unclear and insufficient (WHO, 2016). There is a great need for better evaluations because the factors that influence crime, violence and aggressive behaviors are multifaceted and the solutions most likely of complex nature (Eigenschenk, 2019).

An important aspect of social health is concepts such as social capital. Social capital relates to the combined resources of the residential area and the residents' trust in each other. There is evidence that participation in community garden projects and community conservation projects, such as planting of trees, can reduce isolation, improve social relationships and increase inter-ethnic contact. However, the effects do not seem to spread to nor affect the local community at large on these issues (Keniger et al., 2013), probably because stronger efforts and larger programmes of long duration are required to (have a chance to) make a difference.

In Sweden, allotments for gardening are common features in cities. Allotments seem not only to increase levels of physical activity in their owners, but also promote good and healthy eating habits including increased intake of fruit and vegetables compared to other people. Allotments also promote a sense of security, caring for and increase people's sense of pride in their neighbourhood. Researchers have also found positive links between allotments for gardening and sustainable food consumption. If a larger proportion of household food is grown locally, without long fossil-

*Access to nature and outdoor recreation areas is a prominent factor when people choose where to settle and when buying accommodation in Sweden.*

dependent transports for shipping and purchasing, that will promote sustainable food consumption and healthier eating habits (The county health rankings & roadmap program, 2020).

Another aspect of social impact is people's choice of place of residence. An important factor when people choose where to live is the opportunities for outdoor recreation and the availability of outdoor recreation areas in the neighborhood. Access and proximity to outdoor recreation areas is a prominent factor when choosing a residential area/accommodation in Sweden according to studies. A total of 40 percent of the respondents in the national survey within the research programme "Friluftsliv i förändring" ('Outdoor Life in Change') stated that access to nature to a large or to some degree influenced their choices (Swedish Environmental Protection Agency, 2013). In 2019, the share had risen to 52 percent (Swedish Environmental Protection Agency, 2019).

For children, play is a very important aspect of physical activity and outdoor recreation for reasons of health, learning, development and for building social relationships. Nature and recreation areas are of great importance for children's play and stimulate play in different ways compared to playgrounds. Loose natural objects stimulate imaginative play, and the natural environment promotes extensive play (Boverket, 2013). In nature, it is generally easier for children with different skills, interests and gender to play together compared to in indoor environments (Mårtensson, 2012), a fact which promotes equality.

## Effects of organized outdoor recreation

Organized outdoor activities or outdoor recreation-like programmes obviously have added value for society and intrinsic values for individuals, such as those described above through the activities of the Scout Movement. A systematic review examined the effects of nature-based outdoor programmes – including wilderness adventures – on offending or high-risk youth from socially disadvantaged backgrounds (SMCI Associates, 2013). The programmes were found to be effective with a lower risk of recidivism and a higher chance of getting a job after participating in the programs.

A similar review (Coalter, 2010) examined the link between outdoor programmes based on hiking in forests and mountains and health. The review found positive effects on physical health for school students, youth convicted of crimes and adolescents at high risk of a criminal lifestyle. Outdoor programmes were also positive for young people diagnosed with ADHD. Examples of positive effects with the programmes were increased physical activity, improvements in the cardiovascular system, endocrine system, better bone health and strengthened immune system.

There is also evidence that activity-based programmes, which often take place outdoors in various settings, are effective in promoting physical and mental health, strengthening positive behaviors, and social health in children and adolescents who have previously sought therapy, according to a systematic review (Cahill et al., 2020). Effective strategies included offering excursions with overnight stays in nature, sports and exercise-oriented activities, play and participation in creative art creation. These activities and programmes are very similar to the activities organized by many outdoor organizations in Sweden.

Outdoor recreation programmes also seem to have positive psychosocial effects for children affected by various type of cancers. A 2019 review (Neville et al., 2019) concluded that children who participated in outdoor programmes during the summer holidays ("summer camps") experienced increased quality of life, increased self-esteem, increased motivation and a strengthened sense of being "like any other child". These are important factors for cancer patients' treatment and recovery, even if the programmes have no direct effects on the disease itself.



### 3. Outdoor Recreation, Finance and Health Economics

#### Introduction

The fact that people engage in outdoor activities, come into contact with nature and have access to and use recreation areas also has bearings on finance and economic sustainability in society. The more outdoor activities can reach adults and older groups, the greater the positive health economic effects. Investments in recreational environments and promotion of outdoor recreation in the population are socio-economically profitable: Each SEK invested gives almost four SEK back in economic and social values according to the current research body.

#### Private finance

Outdoor activities, especially in residential locations, are often associated with low costs for the individual, for example in comparison with many other leisure activities, such as participation in organised sports or culture (Eigenschenk et al., 2019). Outdoor activities can be free of charge and do not necessarily require expensive equipment, which is positive for equal conditions for outdoor life and allows many groups to engage in such activities. Organized outdoor activities are also associated with low membership fees in Sweden. In addition, most outdoor activities are not associated with long and costly transports: 70 percent of visits to recreation areas are done on foot or by bicycling, according to the Swedish Environmental Protection Agency's survey (2013). Walking and cycling, of course, are very cheap modes of transport. Walking is by far the most common form of leisure and exercise in Sweden and is a free/cheap form of exercise for the individual.

At the same time, outdoor recreation activities have become increasingly focused on specialized equipment and products, leading to higher costs to engage (Fredman et al., 2013). Many families also lack proper equipment, which is a barrier to outdoor recreation. Many physical education teachers in Sweden testifies that families today do not have relevant equipment such as skates and skis to the same extent as in the past. High costs are one of the most common reasons why people refrain from both sports and outdoor activities, which tends to affect groups with low socio-economics to a greater extent compared to other groups (Faskunger, 2013; Faskunger & Sjöblom, 2017). In recent years, initiatives have been taken to improve the situation, for example through Fritidsbanken where you can borrow leisure equipment for free for two weeks at the time.

## Health economics

Health economic aspects of outdoor recreation are about its costs, benefits and possible future savings for society when people engage in outdoor recreation. Health economics can also focus on how cost-effective certain interventions and programmes are to stimulate behavioral change, for example evaluate the costs of an open-air programme to increase participants' physical activity and change other lifestyles.



Research shows that outdoor recreation programmes can be cost-effective, relatively inexpensive, and promote behavior change and health among the participants, for example, by hiking on trails and spending time in recreation areas (Mitten et al., 2016). Another study found that participants in outdoor programmes had a greater maintenance of physical activity compared to participants in indoor programmes (Glover & Polley, 2019).

Programmes with outdoor activities can also help save money for society. Society's costs are very high for diseases strongly associated with sedentary lifestyles. This is especially the case in middle-aged and older people with an annual health care cost of SEK 80 billion per year. These include health care costs for stroke, type 2 diabetes, dementia, falls, and overweight and obesity (Hagberg, 2017). Sedentary lifestyle as an individual risk factor for ill health is estimated to cost Swedish society large amounts every year. When one adds up the costs of sedentary lifestyles and insufficient physical activity, it is estimated that the cost for a country the size of Sweden (10,5 million people) annually amounts to almost SEK 90 billion (Kolu et al., 2022). The costs affect not only health care under regional management, but also the 290 municipalities in Sweden through increased costs for elderly care as well as lower productivity and increased sick leave in working life.

It is very difficult to assess the overall health economic effects of existing outdoor recreation and organized activities in society, not least because of the difficulty in classifying people as active and not active in outdoor recreation. Is it enough to engage in outdoor activities once a month or is the requirement several times each week to be counted as outdoor active? Most of the population engage in outdoor activities at least a few times each year, which makes it difficult to compare different groups from a health economic perspective. Does the experience of outdoor recreation matter? Is there a difference between participating in and having experiences of organized outdoor activities compared to engaging in spontaneous and "private" outdoor recreation? And so on.

Instead, health economic studies often evaluate the effects "on the fringe", that is, the effects if more people would engage. The effects of outdoor

recreation on children, middle-aged and older people are described below. The text focuses on the effects if organized outdoor recreation would reach and engage more groups – groups that would otherwise have continued to have sedentary lifestyles.

The relative health improvements of increased physical activity in relation to sedentary lifestyles are well known for a wide range of diseases and symptoms (Malm & Isaksson, 2017). Based on this evidence, it is possible to assess and evaluate what the promotion of outdoor recreation would contribute from a health economic perspective.

## Children

Children and adolescents as a group are relatively healthy and have a low need for health care compared to older groups. The biggest health economic effects of regular outdoor activities during adolescence are reduced risk of mental ill-health and better well-being, since depression, anxiety and depressive symptoms are very common in adolescents and the proportion also seems to be on the increase: 60 percent of Swedish adolescent girls and 40 percent of boys had depressive symptoms in 2013 (National Board of Health and Welfare, 2013) and the share has increased since then. School performance and learning will also improve with increased focus on outdoor recreation according to existing research and reviews of the evidence (Faskunger et al., 2018). If outdoor recreation would reach an additional 1000 children (who would otherwise have remained sedentary and not engaged in outdoor recreation), it would prevent 50 cases of depression, 250 "cases" of stomach aches and headaches, while the school performance of at least 50 students would improve as a direct effect of better mental health in the group. However, the direct health economic effects are small because the group does not have a great need for health care at this young age (Hagberg, 2017). One can also assume that children and adolescents who engage in outdoor activities during their formative years – especially if it leads to positive experiences – will generally have a more active lifestyle as adults in general ("tracking"), which indicates a future health economic saving.

## Adults

In middle age, the risk and incidence of many "common diseases", such as back pain, stress, type 2 diabetes and cardiovascular disease, increases, but the group is still relatively healthy and not in great need of health care services. If outdoor recreation programmes and activities would engage 1,000 adults (who would otherwise have remained sedentary), it would prevent ten premature deaths (equivalent to 200 life years gained and 150 QALYs: quality-adjusted life years), 20 cases of type 2 diabetes, 50 cases of myocardial infarction and 150 cases of hypertension. Other effects of increased outdoor recreation would be a reduction in health care costs and SEK 500–5,000 lower cost per person and year through lower absenteeism from work (Hagberg, 2017). In addition, one can assume that middle-aged people who engage in outdoor activities will generally be more physically active in older age which indicates a future health economic saving.

## The elderly

The greatest risk of disease, prevalence of endemic diseases and societal costs is found in the group of elderly. Health care costs increase dramatically for this group compared to in younger groups (Hagberg, 2017). The annual cost of health care in the group amounts to approximately SEK 80 billion per year in Sweden. The potential to reduce society's costs for sedentary lifestyles is very large, for example by preventing the onset of common chronic diseases, postponing the onset of the diseases and alleviating symptoms of existing diseases (Hagberg, 2017). Regular participation in outdoor activities can play an especially important role in prevention programmes, as outdoor recreation and spending time in nature is an already appreciated form of leisure activity among the elderly and has major positive health effects.

Hagberg (2017) estimates that the cost of sedentary lifestyles is around SEK 16 billion per year in Sweden, while an international estimate indicates a cost of SEK 25 billion for a country the size of Sweden (Biswas et al., 2015). Older people who increase their physical activity generally reduce their health care costs by at least one third (Norling & Larsson, 2004). In Norway, it has been estimated that if each resident walked an extra 10-15 minutes every day, it would mean a health benefit equivalent to NOK 250 million per year.

People who are regularly physically active throughout their lives are expected to live about 3.25 years longer than people with sedentary lifestyles. The active group will also have significantly more years in perceived good health, a total of 8.28 QALYs (quality-adjusted life years: years with good quality of life) compared to the physically inactive group (Saalensminde & Torkilseng, 2010). If recreation programmes can engage more individuals from the elderly group, who would otherwise have lived a sedentary life, it would lead to very large financial savings for society. Each QALY won is worth a lot of money from a health economic perspective. As the proportion of older people in society increases, so does the health economic importance of promoting outdoor recreation and physical activity. It should be emphasized that older people are extra dependent on residential outdoor recreation areas and other green areas compared to other groups to be able to live active lives, which community planning needs to capture.

## Local and regional economics

Outdoor recreation and access to outdoor recreation areas can also have an impact on local and regional economies through outdoor and nature tourism. This is partly about more guest beds being filled, increased consumption of, among other things, food and service, etcetera, and partly by strengthening the destination and the region's brand. Such effects may be particularly important in sparsely populated areas where tourism accounts for a larger share of the total industry compared to in cities.

Outdoor and nature tourism is one of the fastest growing industries in the world. In sports, there is a clear link between popular events and the destination's enhanced brand. Many Swedish participatory sports events taking place in outdoor areas (e.g. Vasaloppet cross-country ski race and Öringen in orienteering) have significant economic effects, strengthen the destination's brand and also contribute to raising competence and pride of the locals/functionaries (Pettersson & Wallstam, 2017). A similar effect for attractive and popular outdoor destinations is likely.

The most common outdoor seasons from a tourism perspective are of course summer and winter, but many outdoor activities can also be carried out in spring and autumn, that is, have the potential to spread tourism over the year and extend the season, which is important for local and regional economies. Spreading outdoor tourism over the year can potentially reduce the load on outdoor recreation areas. To further contribute to the local and regional economy, it is important to develop the functions of recreation areas according to the principle: whole-year accessibility, more possible activities and open to a larger proportion of the population. However, such measures need to be carefully planned and evaluated to promote sustainable development and not causing negative effects, for example pollution, conflicts, wear and tear and littering.

Outdoor tourism is increasing in Sweden and has been for a long time. Swedes spent just over SEK 96 billion on outdoor activities in 2009, of which three quarters where in Sweden – almost SEK 10,000 per person per year. Almost half of the expenditure (45%) was in the region where the person lives (Swedish Environmental Protection Agency, 2013). The total valuation (consumer surplus) of outdoor recreation as an activity was just over SEK 33 billion – that is, one third of actual expenditure. According to the Swedish Agency for Economic and Regional Growth (2011), foreign visitors spent approximately SEK 90 billion per year in Sweden in 2010 – a sum that has increased to a whopping SEK 337 billion in 2018 (Swedish Agency for Economic and Regional Growth, 2018). The proportion of expenditure spent in the outdoor recreation sector is unclear, but in Finland the total expenditure of international tourism in the outdoor sector is around 20 per cent (Finnish Environmental Protection Agency, 2013). Outdoor related activities such as hiking and visits to national parks are among the ten most common activities for foreign visitors in Sweden (Swedish Agency for Economic and Regional Growth, 2015). In the United States, outdoor recreation and other nature tourism account for 2.2 percent of the country's total GDP, generating 4.5 million jobs each year (Highfill & Franks, 2020). The Swedish Agency for Economic and Regional Growth states that 25–30 percent of all foreign visitors to Sweden engage in outdoor activities and 9 out of 10 want to take part in the Swedish nature during their holiday. Approximately 172,000 jobs and 10,000 companies are directly linked to nature tourism and outdoor recreation in Sweden in 2018 and the trend has long been a sharp increase in employment and the number of companies.

Sales have more than doubled since 2000 (Swedish Agency for Economic and Regional Growth, 2018).

How better access to outdoor recreation areas affects the economy is relatively unexplored. The creation of nature reserves and especially national parks leads to more visitors and to increased employment in the locality, especially in the first years. But the long-term and regional effects are unclear according to the Swedish Environmental Protection Agency (Swedish Environmental Protection Agency, 2013). The effects on the regional economy with outdoor recreation and access to outdoor recreation areas are also about the health status of the population. Since municipalities with a high proportion of healthy populations generally have a stronger economy than those characterized by a high proportion of sick population (Malmberg & Andersson, 2006 cited in Zettersten, 2007), outdoor recreation and the opportunities for outdoor recreation become important to pay attention to.

In addition to direct effects on the economy through tourism, there is a great economic value in the population's estimated value of having access to outdoor recreation areas and forests. Half of Sweden's surface is covered by forest and the forest is of course one of the most common places for the population's outdoor activities, for example through walking, mushroom and berry picking, fishing and other hunting. There are approximately 373 million visits to the forest every year in Sweden. The estimated economic value of the population's forest visits has been estimated at SEK 20 billion annually. The value corresponds to the sum for the entire wood production in Sweden during one year. In southern Sweden, the value of forest visits is probably higher than the value of timber production, since people there value forest visits more than in northern Sweden. Both hunting and a large proportion of all fishing are also associated with the forest as an environment. The annual value of all types of hunting in Sweden is estimated at just over SEK 3.1 billion, of which two-thirds is about the recreational experience itself. A similar value has been placed on fishing in Sweden (Fredman et al., 2013).

The Swedish mountains occupy a special position when it comes to the population's most highly valued outdoor environments, for example through downhill skiing, hiking and snowmobiling. The estimated value of the mentioned activities is very high. The total value of alpine downhill skiing is estimated at SEK 1,500 million per year, while hiking and snowmobiling are valued at SEK 140 million and SEK 365 million per year, respectively (Fredman et al., 2013). Internationally, studies have found that people are prepared to pay between SEK 70-200 per nature visit to access nature visits according to the willingness to pay method. They are also prepared to pay for local conditions to visit outdoor recreation areas to be improved (Lynch, 2020).

The link between holiday homes and outdoor activities also has a bearing on the local and regional economy. One of the most important reasons for owning holiday homes is that owners want better opportunities for outdoor

recreation according to Lundmark et al. (2013). Over half of the Swedish population either owns or has access to holiday homes (Lundmark et al., 2013) and visits to holiday homes can have significant positive effects on the local economy. It is also relatively common in Sweden to rent holiday homes to be able to engage in outdoor recreation and get closer to attractive outdoor areas.

The social value of all protected nature in the world has been estimated at SEK 6,800 billion per year (Balmford et al., 2015).

## Economics

The organized outdoor recreation in Sweden is largely built around non-profit activities and unpaid leaders, which has very great economic value for society. The total value is difficult to assess, but a Swedish investigation stated that the total turnover per year amounted to approximately SEK 35 billion in the late 00s, of which the outdoor recreation organizations accounted for just over SEK 1 billion (Fredman et al., 2008).

Which areas and environments for physical activity and outdoor recreation are economically profitable to invest in? Preserving and developing outdoor recreation areas and promoting outdoor recreation are among the least costly sectors of a municipality, both in terms of operation and in new investments. Preservation and enhancement of urban nature is especially important since over 80 percent of the population in Sweden lives in cities and urban areas.

Research shows that nature and outdoor recreation areas that can be used regularly and all year round by a large proportion of the population have the best conditions for having high societal benefits and providing economic added value (National Institute of Clinical Excellence, 2008; Faskunger & Sjöblom, 2017). Constructing green paths, hiking trails and jogging tracks that can be used for many different types of activities, such as walking, cycling, jogging, cross-country skiing, is often a cost-effective measure and increases physical activity in the population. Each invested kr gives several kr back in the form of reduced illness from chronic diseases in the population, reduced sick leave from the workplace and increased productivity, according to a comprehensive English systematic review (National Institute of Clinical Excellence, 2008). If such areas are also located in residential and urban locations, the likelihood of them being used frequently and by many people increases, which lowers the cost per user.

The costs to society with sedentary lifestyles can be counted in many billions each year (WHO 2018). In Finland, a recent study has shown that society's costs for insufficient physical activity and high volume of sedentary time in the population (5.5 million inhabitants) amount to SEK 47 billion per year, assuming that 1 Euro = 10 Swedish SEK (Kolu et al., 2022). Recently published research shows that investments to promote physical activity in the population or targeted at specific groups and to invest in movement-

promoting cities, areas and places or facilities are socio-economically profitable: Each kr invested gives nearly four kr back in values related to reduced health care costs, well-being in the population, lower absenteeism and increased productivity (Sheffield Hallam University, 2021). Investments in walking and cycling infrastructure and promoting walking and cycling in the population have shown even greater socio-economic benefits and values with between SEK 6–36 back on each invested kr (WHO, 2022).

There is significant economic benefit from having wooded outdoor recreation areas in or around cities through a large number of ecosystem services. A study by Elmqvist et al. (2015) showed that society's monetary benefits from woods and forests far exceeded the costs of establishing and managing the areas. The study examined investments in 25 different cities, and in all cases the benefits were higher than the costs and created better urban environments. The five ecosystem services involved regulating air pollution, temperature and stormwater, sequestering carbon and promoting outdoor recreation in the population.

The economic value of nature-rich regions has been underestimated in Sweden, for example by not considering the value and benefits of ecosystem

*Establishing nature reserves is a relatively inexpensive measure for municipalities and county administrative boards and also protects outdoor recreation areas from being exploited*

services. For example, a study from 2009 showed that if one calculates the value of ecosystem services for the nature- and forest rich northern parts of Sweden, the economic differences between "the rich" South and the poorer North were evened out. The value of ecosystem services in Northern Norrland more than doubled, partly thanks to the forest's great potential to store carbon and nitrogen (Gren & Isacs, 2009).

Establishing nature reserves is a relatively inexpensive measure for municipalities and counties. It also protects recreation areas from being exploited. However, knowledge about the socio-economic effects is relatively inadequate, among other things, because we know very little about how the formation of a reserve affects the population's use and levels of outdoor recreation. A reserve is likely to increase the number of visitors, at least in the short term (Swedish Environmental Protection Agency, 2013), thanks to higher status and more marketing. Additionally, municipalities or counties signal that the areas are worth protecting and have attractive nature for, among other things, outdoor activities. But a reserve formation



could also potentially put an end to or complicate certain forms of outdoor recreation, which could reduce the number of visitors – it all depends on the specific regulations and rules. Two very popular forms of outdoor recreation, MTB cycling and cross-country skiing, are examples of activities that would disappear if the reserve regulations state that it is forbidden to build gravel paths and to cycle on trails.

Homes with recreation areas and other nature areas nearby have higher economic value and are more attractive for sale than homes in areas without good access to such areas (WHO, 2016). Marketing cities and residential areas with messages of good access to recreation areas and nature has become common in urban development projects to attract private individuals. Good access to nature also seems to promote employment and speed up housing sales (Faskunger, 2013). Many municipalities market new residential areas with arguments concerning good access to outdoor recreation and nature. Investing in more green spaces/outdoor recreation areas in cities and towns can increase productivity and reduce sick leave from the workplace, promoting tourism and employment in the "green sector" (Cianga & Popescu, 2013).

## 4. Outdoor Recreation, Nature and Environment

### Introduction

Nature and outdoor recreation areas are strongly associated with sustainability, perceived attractiveness of land and good conditions for outdoor recreation. Cities with many parks, outdoor recreation areas and trees contribute a wide range of ecosystem services to society. Outdoor recreation areas have a wide range of positive effects on the environment and ecology in urban environments and cities, for example to dampen/reduce noise, reduce air pollution, counteract the greenhouse effect, counteract heat waves caused by hardened surfaces and buildings, promote biodiversity and dispersal and offer efficient management of stormwater.

### Outdoor recreation, nature and environment

Access to recreation areas and nature is not only important to promote and facilitate outdoor recreation in the population, but also to promote environmental sustainability and to generate ecosystem services. This research is only briefly discussed here, but is described in detail in the report from the Swedish Environmental Protection Agency "Arguments for more ecosystem services" (2017). Outdoor recreation areas have a wide range of positive effects on the environment and ecology in peri-urban locations and in cities, for example to dampen/reduce noise, reduce air pollution, counteract the greenhouse effect, counteract heat waves caused by hardened surfaces and buildings, promote biodiversity and dispersal and offer efficient management of stormwater (e.g. Coutts & Hahn, 2015). All these factors can in one way or another affect the conditions for outdoor recreation. It is also reasonable to assume that outdoor recreation indirectly contributes to positive environmental effects through the fact that outdoor active groups have a great interest in preserving and developing outdoor recreation areas and preventing them from being exploited in future densification and expansion of the built environment.

### Noise and Vandalism

Noise is an increasingly prominent threat to human and animal health and welfare due to increasing urbanization, densification of areas with housing and other buildings, increasing motorized traffic and decreasing access to quiet areas and places in cities (Boverket, 2013). Outdoor recreation areas and other green environments can reduce noise pollution and offer more quiet places and areas for people and animals (WHO, 2016). At the same time, many visitors experience noise as a problem when staying in outdoor recreation areas – 50 percent of the Swedish population state that they are exposed to external noise during outdoor activities, for example from motor vehicles (Swedish Environmental Protection Agency, 2019). It is unclear

whether noise makes many people refrain from visiting outdoor recreation areas, or if it "only" diminishes the value of the visit.

Littering and vandalism can also negatively affect the propensity or likelihood to visit outdoor areas and to engage in outdoor activities (Faskunger & Sjöblom, 2017). Littering and vandalism can lead to experiences of insecurity to visit outdoor environments, and insecurity has a significant negative effect on levels of physical activity, not least for women, the elderly and people with functional variations (Faskunger & Sjöblom, 2017). The corresponding proportion of the Swedish population that experiences littering in outdoor recreation areas amounts to 60 percent (Swedish



Environmental Protection Agency, 2019).

## Pollution

Air pollution is a serious and major threat to human health and public health in the population, but greenery and recreational areas can counteract some of the negative effects. Around 10 million people die prematurely in the world each year due to outdoor air pollution (Shindell, 2022). In Sweden, the number of premature deaths amounts to around 7,700 people annually. People who already have an increased risk of ill health and disease are hit harder than other groups (Gustavsson et al., 2018). The emissions that cause climate change in the world also cause virtually all air pollution. Preventing the burning of fossil fuels in the world would bring immediate and powerful improvements to both public health and air as 20 percent of all deaths in the world are due to pollution caused by the burning of fossil fuels. Air quality improves very quickly after reductions in emissions (Shindell, 2022). A country like Sweden could finance several years of societal transition and climate action by immediately reducing emissions as agreed in the Paris Agreement, which would provide cleaner air, save many human lives and reduce societal costs.

Outdoor recreation areas, parks and other green environments can reduce human and animal exposure to air pollution from, for example, motorized traffic, in addition to the vegetation in outdoor recreation areas binding carbon dioxide. Recreation areas can contribute to cleaner water by acting as a filter for stormwater. Recreation areas, parks and other green environments can reduce human and animal exposure to air pollution from, for example, motorized traffic, in addition to the vegetation in outdoor recreation areas binding carbon dioxide. Outdoor recreation areas can contribute to cleaner water by acting as a filter for stormwater. Research shows that up to 85 percent of pollutants can be filtered out or absorbed with a high proportion of vegetation and greenery, and the right kind of vegetation (Swedish National Institute of Public Health, 2009).

A concern that has been raised by researchers and journalists alike is that increased outdoor recreation potentially could lead to greater negative health effects in humans via increased exposure to pollutants in air and water, compared to the health benefits of regular physical activity. However, this is far from the case. A Danish study that followed 52,000 middle-aged adults for 20 years recently showed that the health effects of outdoor physical activity very strongly outweigh the risks of increased exposure to air pollution while being outdoors. The health benefits outweighed the risks by a factor 20:1. Even in the most polluted cities of the planet, the health risks of being outdoors would not outweigh the health benefits of outdoor physical activity (Andersen, et al., 2015).

## Heat

Heat waves are an increasing threat to public health as well as for recreation areas and the conditions for outdoor recreation due to global climate warming – also in Sweden. Globally, heat accounts for over 1 percent of deaths each year, on par with what malaria causes. Man-made climate change is responsible for almost 40 percent of all heat-related deaths in the world. Rising temperatures will greatly increase the number of heat-related deaths in the future. Unless sufficient efforts are made to prevent further warming of the climate, the number of heat-related deaths in already heat-prone countries will increase tenfold. However, deaths are only the tip of this melting iceberg: Increased heat in the world will also lead to increased number of cases of cardiovascular diseases, worsen underlying conditions such as lung diseases, aggravating complications in pregnancies including risk of premature births (Vicedo-Cabrera, 2022).

Heat waves are not least a problem in cities with many paved and grey surfaces, especially in vulnerable groups such as the elderly, groups with underlying diseases and pregnant women (WHO, 2016). Rural areas are also affected by heat waves. Heat waves claim many lives in vulnerable groups. The optimal daily average temperature for preventing premature death is

about 11–12 degrees and each degree increase in the average temperature increases mortality by 1.4 percent – even more in the elderly – according to the National Board of Health and Welfare in Sweden (2011).

Children from today's generation will experience 36 times more societal and public health hazardous heat waves during their lives compared to adults born in the 1960s (Ghebreyesus, 2022). Outdoor recreation areas, trees and vegetation contribute to lower temperatures during heat waves. Residential outdoor recreation areas and parks in cities lower temperatures by an average of 1 degree in cities compared to cities without green spaces, according to a systematic review and meta-analysis (Bowler et al., 2010). The lowering of temperature applies in a radius of about 1 km from the area/park, and there is also evidence that lakes and streams further strengthen the cooling effect (Völker et al., 2013). Greenery on streets, especially large deciduous trees, can have a dramatically cooling effect on the microclimate and provide access to shade. A survey in Norrköping during the summers of 2017 and 2018 showed very large differences in temperature on a street with many trees (lower temperature) compared to a street without trees (higher temperature) on hot days. The difference in temperature was as much as 10 degrees even though the streets were almost adjacent to each other in a north-south direction in central Norrköping (SKL, 2019).

Heat waves, lack of green spaces and lack of shade in cities risk complicating outdoor recreation or making outdoor recreation less attractive, among other things through increased risk of dead trees and plants, many open spaces become difficult to stay in bright sunshine, higher exposure to UV radiation, low flows in watercourses, poorer water quality and increased risk of fires (SKL, 2019). At the same time, the risk of sudden downpours and floods increases in warmer climates and during heat waves, which can potentially complicate outdoor activities or impair the experience. The global warming of the climate is also obviously a threat to prominent and popular outdoor activities in Sweden such as skiing and long-distance skating, especially south of the Dalälven river and along the coast of Norrland where over 70 percent of the Swedish population lives.

## Flooding

The risk of flooding increases with a warmer climate, for example during heavy rainfall and due to rising seas and increased annual precipitation. Floods have become 2.34 times more common in the 2000s compared to the 1980s and 90s and they will become even more common in the future due to climate changes. Flooding can make stays in outdoor recreation areas more difficult and lower the experience for visitors.

However, the presence of recreational areas and nature in cities and landscapes are important tools for managing floods and a warmer and more humid climate. Outdoor recreation areas in cities or peri-urban locations can counteract flooding and offer cost-effective management of

stormwater and other systems of water (WHO, 2016). Water and stormwater management is an expensive task for municipalities both in terms of investments and maintenance/operation. The management of stormwater and other systems also creates a good living environment for new and existing plants and animals and can improve conditions for outdoor recreation (WHO, 2016).

## 5. Outdoor Recreation and Environmental awareness

### Introduction

There is a general assumption in society that when people spend time in outdoor areas and engage in outdoor activities, they are more prone to care about nature and wanting to preserve it. This in turn is important to protect nature for future generations and creating popular support for efforts and measures to counteract the climate crisis. However, the overall scientific knowledge base for such a link is not as strong as one might think, partly because the connection is difficult to evaluate and the definitions of what environmental awareness means are unclear. Studies on children have generally found stronger links between outdoor recreation and environmental awareness compared to in adults.

### Environmental awareness in adults

There is some evidence that nature contact and outdoor recreation have positive effects on nature understanding, environmental awareness and a sense of personal control, while little experience of spending time in outdoor recreation areas can reduce environmental commitment. The field is difficult to evaluate scientifically and the number of published scientific articles relatively few. It is like the classic riddle of what came first; The chicken or the egg?

Does outdoor recreation lead to an increased environmental commitment, or is outdoor recreation an expression of an already strong environmental commitment among people (Wolf-Watz, et al. 2013) A large part of the Swedish population gains increased insight into the interaction in nature and a sense of being part of it themselves when they spend time in outdoor areas. The three most important motives for engaging in activities in nature are to practice physical activity, experience relaxation and to be close to nature (Swedish Environmental Protection Agency, 2013) which indicates a connection but does not prove it. Friluftsförbundet's project in Skåne, in southern Sweden, called Häng med oss ut! (Ståhl et al., 2021) has recently shown that patients with psychiatric diagnoses gained increased environmental awareness through outdoor recreation and visits to nature. Future research needs to compare such interventions against a control group that receives standard treatment or is on a waiting list for treatment.

### Environmental awareness in children

In children, there is a stronger connection between outdoor recreation, contact with nature and environmental awareness according to existing research. Children with good access to outdoor recreation areas and greater contact with nature are more likely to show high environmental

commitment, according to a Swedish report (Swedish Environmental Protection Agency, 2013) and a doctoral thesis that examined children from Gothenburg and Stockholm (Sandberg, 2012). Several systematic reviews and similar international reports (Greenspace Scotland, 2008; Gill, 2011; Gill, 2014) also shows that regular time in nature for children and adolescents promotes environmental awareness and a sense of nature later in life. Children without emotional ties to nature are less likely to protect it. Regular nature visits improve students' mental health, emotional control and impulse control (Faskunger et al., 2018). This applies both to students with and without specific diagnoses (for example, ADHD). It is important that pupils are taught about the right of public access, the environment and outdoor recreation. Students who participate in teaching in school gardens perform better in science subjects, develop healthier eating habits and care about and want to protect nature more compared to students who have not received such education according to a Swedish knowledge review (Faskunger et al., 2018). However, this is an area that requires more research to strengthen the knowledge base. Existing review articles on outdoor recreation, nature and environmental awareness are presented in Appendix 1.





## 6. Outdoor Recreation, Social Inclusion and Equity

### Introduction

There is a lack of research on the effects of outdoor recreation on integration and inclusion in society, largely because the phenomena are difficult to measure and define. What is meant by integration and inclusion? Few scientific studies have had integration and inclusion as outcome measures. However, there are plenty of good examples from Sweden and internationally where outdoor recreation and recreation areas have been used for such purposes with good results. The experiences are often summarized in report form.

Inclusion is about all people and groups having the same opportunities and rights to take part in and influence society, including being able to engage in and participate in outdoor activities. However, the opportunities for outdoor recreation differ between different groups, depending on, among other things, socioeconomics, perceived health, presence of functional variations, gender, ethnicity (Swedish Environmental Protection Agency, 2019). There is a lack of research on the effects of outdoor recreation and recreation areas on the integration and inclusion of less outdoor active groups.

### Promotion of outdoor recreation in ethnic minority groups

There is a great need to promote outdoor recreation to groups that are least active in the outdoors, such as groups with a non-European background. Residents who have grown up in Sweden or in other European countries are more often out in nature and engage in outdoor activities compared to those who immigrated or whose parents immigrated from a country outside Europe (Swedish Environmental Protection Agency, 2019). Residents who have immigrated or whose parents immigrated to Sweden from an overseas country generally experience more obstacles to outdoor recreation and visiting nature than those born in Sweden. This is especially true of a perceived lack of equipment, high perceived costs and that there is no access to suitable places or no one to practice the activity with (Swedish Environmental Protection Agency, 2019).

Immigrants from non-European countries also report poorer health than people born in Sweden (Folkhälsodata, Folkhälsomyndigheten), which can potentially reduce the propensity to engage in outdoor activities. Ethnic minority groups have at least as great positive effects on health and well-being from spending time in outdoor recreation areas and from engaging in outdoor recreation as the majority group in a given country (Gentin, 2019). The same applies if one examines the effects of regular physical activity and exercise where people with the lowest level of physical activity get the greatest effects from becoming more physically active. Recreation areas also have the potential to be a safe platform and easy meeting place to

promote learning, intercultural contacts and maintain cultural traditions among ethnic groups (Stodolka et al., 2016; Gentin, 2011; Gentin et al., 2019), as well as promoting a sense of place at the place of residence (Bennet, 2014; Peters et al., 2016). However, the knowledge base is insufficient regarding which "green" interventions and strategies are effective in promoting integration – almost no study has focused on integration as a phenomenon, that is, not had integration as an outcome measure in evaluations (Gentin, 2019; Nordic Council of Ministers, 2017).

## Good practice

A report from the Nordic Council of Ministers in 2017 showed that it is relatively common in the Nordic countries to use outdoor recreation and nature in programmes designed to promote integration. Many such programmes are perceived to be successful and produce positive results according to both organizers and participants. Swedish reports authored by Hadders & Rosengren (2006) and Mushtat (2008) also showed very positive experiences of outdoor recreation programmes and nature initiatives for people with immigrant backgrounds in different parts of the country. The initiatives are often used as an introduction to the new society, in language teaching, for skills development, to learn a profession linked to the green industry and to generally promote movement and outdoor activities (Nordic Council of Ministers, 2017). In Sweden, many organizations use outdoor recreation as integration and education tools, such as the Red Cross, municipalities, outdoor organizations, foundations and SFI (Swedish for Immigrants) and Muslim organizations. Examples of common outdoor activities are berry and mushroom picking, camping, canoeing and kayaking, horse riding, skiing, bird watching, hiking, cycling and gardening. Another conclusion of the report was that outdoor recreation and contact with nature could be used even more in integration work than is done today (Nordic Council of Ministers, 2017).

## Promotion of outdoor recreation in groups with functional variations

There are large knowledge gaps about how outdoor recreation can be promoted in groups with functional variations, but the need is undeniably great: About 1 in 5 people, about two million people, in Sweden state that they have one or more functional variations. The proportion who state that they have a disability that seriously affects their everyday life and lifestyle amounts to about 1 in 10 (1 million people). Promoting outdoor recreation in this group is important based on principles of public health, equal health, democracy, influence, meaningful leisure time, and more. People with one or more functional variations are less likely to be out in outdoor recreation areas compared to those with no disability. According to the Swedish Environmental Protection Agency (2019), 45 percent of people with disabilities have been to outdoor recreation areas (forest and land) six or

more times during the year. The corresponding proportion for people without disabilities was 64 per cent. It is twice as common with a sedentary leisure time among people with functional variations compared to people without functional variations (Public Health Data, Public Health Agency of Sweden).

Outdoor recreation can contribute to achieving the goals of Swedish disability policy and in the work against discrimination in society, but at the same time many outdoor recreation areas in Sweden are not sufficiently accessible and passable for people with functional variations (Swedish Environmental Protection Agency et al., 2013). Other actors highlight unclear rules for transport services with different conditions in different parts of the country, as well as a lack of service and supply, such as toilets, at outdoor recreation areas. The lack of research is partly about how actors through programmes and activities can attract outdoor recreation among this heterogeneous group, and partly to remove accessibility and physical barriers to accessing and using recreation areas. The publication by the Swedish Environmental Protection Agency and others (2013) provides good guidance on how to build and design more accessible recreation areas.

A very important form of outdoor recreation for people with disabilities is horse riding. Horse riding is the second largest sport in Sweden and the largest disability sport. Sweden is the second most horse dense in Europe. Riding makes it easier for people with functional variations to get out into nature, to engage in physical activity in addition to offering a positive social context (Boverket, 2013).

## Outdoor recreation, gender equality and social equality

To create equal conditions for different groups to engage in outdoor recreation are important aspects of public health policy, but it has long been known that outdoor recreation is in some respects socially graded. Groups with a higher level of education, good income, people with good health and good access to outdoor recreation areas tend to be more active in outdoor activities compared to other groups in society.

Outdoor recreation is otherwise the activity in the sports and leisure sector that is least associated with obstacles to the population's practice. Many aspects of outdoor recreation and the use of recreation areas can be classified as equal between sexes although there are some differences in preferred activities. Men are overrepresented in activities such as hunting, fishing, running and snowmobiling while women are overrepresented in activities such as walking, sunbathing, picnics and barbecuing and walking with dogs, although the differences are relatively small. The vast majority of outdoor activities are practiced by both men and women (Haraldsson, 2012).

Recreation areas provide good opportunities for movement for practically all groups in society, which in turn is important for promoting equal and equal public health. Safer and more secure outdoor recreation areas promote freedom of movement and independence among groups with limited freedom of movement, such as many elderly people and children, as well as among groups that experience insecurity, such as many women (Faskunger & Sjöblom, 2017). This also applies to people with functional variations – who generally experience more obstacles to movement and mobility than other social groups – if there are facilities and devices in the area that increase accessibility and accessibility. Being a citizen on equal terms should, in practice, mean the right to engage in outdoor activities and spend time in outdoor recreation areas, regardless of functional variations. Not all parts of all outdoor recreation areas in Sweden can be made accessible to everyone, but all outdoor recreation areas can improve accessibility for people with functional variations in some way. An outdoor recreation area that is accessible to people with disabilities benefits all visitors. Knowledge of how outdoor recreation areas can be made accessible to people with functional variations is good. This knowledge is collected in a publication published by, among others, the Swedish Environmental Protection Agency (Naturvårdsverket et al., 2013). Unfortunately, there is no national survey of accessibility to recreation areas in Sweden, but the vast majority of actors in outdoor recreation settings would probably agree that there is a need to improve accessibility to such areas throughout the country.

As mentioned earlier, there are groups in society that use outdoor recreation areas and engage in outdoor recreation to a lesser extent than others, such as people with disabilities, elderly people with low mobility, groups with low socio-economy and residents born outside Europe.

Women perceive outdoor environments and green spaces as significantly more unsafe than what men does. It is four times as common for women to state the outdoor environment as unsafe (Boverket, 2013) and insecurity is a prominent obstacle to physical activity (Faskunger & Sjöblom, 2017) and thus to outdoor recreation. Younger and middle-aged women state that they spend more time in outdoor recreation areas than men do according to national surveys (Swedish Environmental Protection Agency, 2019), while older women spend less time in outdoor recreation areas compared to men of the same age (Public Health Agency of Sweden). The work to create attractive and safe outdoor recreation areas is thus also an investment in equal health. In order to create equal conditions for outdoor recreation and increase women's perceived security to spend time in urban outdoor recreation areas, it may be important to plan and design outdoor recreation areas with an attractive aesthetic design and with security in focus (MacBride-Stewart et al., 2016).

Surveys based on on-site observations show that many important outdoor environments are used as much or almost as much by men as women, such as bathing areas, playgrounds, park games and parks/outdoor recreation

areas. Athletics facilities, jogging tracks and slalom slopes are also used almost as much by women as men (Blomdahl, Elofsson, & Åkesson, 2012). Outdoor recreation can therefore be said to contribute to equal conditions for outdoor recreation, physical activity and health.

The use of these environments is in contrast to many common sports environments such as football fields, ice rinks and spontaneous sports fields where an overwhelmingly large majority of users are men/boys (Blomdahl, Elofsson, & Åkesson, 2012). Organised sport also has a number of male-dominated sports. The proportion of boys/men in ice hockey in Sweden is 88 percent. The corresponding proportion in football is 70 percent. The largest female-dominated sport is equestrian sport (Swedish Sports Confederation, 2020).

Virtually all organized activities in the member organizations of Svenskt Friluftsliv involves activities where men/boys and women/girls participate together both as leaders and practitioners. Research shows that such activities can help challenge many gender norms, promote equal social relations and highlight everyone's competence and skills regardless of gender.

Gender-segregated activities are significantly more common in other leisure activities, for example in the sports movement (Grahm, 2017). Organized outdoor recreation alone cannot lead to an equal society overall, but when organized outdoor recreation is and functions equally organized, it can contribute to the overall work for gender equality.

From an equality perspective, the group of older people is of interest. Older groups are likely to have even greater health effects from outdoor recreation than younger groups because they are generally less physically active and have poorer general health compared to younger groups (Broekhuizen et al., 2013). The same elevated effect of physical activity has been observed in minority groups in a country and in groups with low socioeconomics compared to groups with higher socioeconomics and the majority group in the country (WHO, 2016).

The researchers believe that the greater health effect of outdoor recreation among minority groups and groups with low socioeconomics may be due to, among other things, lower levels of physical activity, lower contact with nature and higher exposure to air pollution in built environments. Outdoor recreation and outdoor recreation areas with a high degree of greenery thus seem to be able to act as a balancing factor for physical activity, among other things, to counteract exposure to air pollution and reduce health inequalities between groups in general (WHO, 2016).



An English study of over 40 million British adults (Mitchell & Popham, 2008) examined the link between participants' socioeconomic status, social vulnerability in the neighbourhood, greenery in and near the neighbourhood, and all-cause mortality and death from cardiovascular disease. The participants were divided into four different groups and followed for many years. There was a very large difference in mortality between the group with the lowest socioeconomics and the group with the highest socioeconomics (1.93 higher risk) in areas that had poor access to greenery. However, the risk of dying decreased markedly in the most vulnerable areas if the residential area also had good access to greenery: The risk dropped to 1.43. A high proportion of greenery in the residential area thus counteracted premature death and reduced the differences in risk of premature death between different socioeconomic groups. The study argued that greenery can greatly reduce socioeconomic differences in premature death from all causes and in cardiovascular diseases by, among other things, offering better local conditions for nature contact, physical activity and outdoor recreation for residents. This is a very important result for future Swedish social and spatial planning and political decisions.

## Equal opportunities for children

Other aspects of gender equality and equality are children's play and movement outdoors, for example in school yards. A schoolyard can contribute to both equal and equal conditions for play and movement. A Swedish study by Pagels et al. (2014) showed that activity-friendly schoolyards have great potential to maintain children's and adolescents' physical activity over time as they get older. The fact that children's physical activity decreases with increasing age is a scientific fact. Such farms also have an important role to play in ensuring equal opportunities for physical activity. Time outdoors was an important factor for high physical activity at a health-promoting level for both sexes, but the design of the yard affects gender patterns in play and movement. The presence of ball fields mainly promoted boys' play and physical activity in middle school, while the presence of nature and forests in or near the schoolyard promoted girls' physical activity at a health-promoting level.

Physical activity was objectively measured with motion meters, so-called accelerometers. Since it has been proven that Swedish girls are less physically active than boys (Nyberg, 2017), investments in green areas and nature in connection with preschools, schools and upper secondary schools can be seen as an important piece of the puzzle in the work to promote equal and equal movement and health in children and young people. Children's play outdoors is often more equal compared to play indoors (Boverket, 2013). Unfortunately, there is a lack of national surveys of the quality and design of preschool and school playgrounds. However, most experts and actors in the field agree that a very large proportion of Swedish school yards need development to encourage play, outdoor education,

physical activity, outdoor recreation and for schools to achieve their goals. More greenery and nature on the schoolyards are central elements in such a development (Faskunger et al., 2018).

## 7. Outdoor Recreation, Education, Learning and Development

### Introduction

The preschool and school setting is an important actor in promoting outdoor recreation thanks to the fact that all children spend a large part of their upbringing in this setting, regardless of socio-economic background. Outdoor education in outdoor school environments and in nearby green environments as well as outdoor days are two examples of how outdoor education can be conducted in school/preschool. Outdoor recreation has many important effects on schools and on students' learning. Preschools and schools can achieve many important educational goals by having more outdoor activities and being outdoors in teaching. Outdoor education and outdoor days generally mean that students move around and are exposed to nature more than when teaching mostly or entirely takes place indoors

*Preschools and schools can achieve many important educational goals by having more outdoor recreation and being outdoors in teaching*

(Faskunger et al., 2018).

The research area is dominated by effects on learning and development in children and adolescents via outdoor initiatives and outdoor education in preschool and school. Research in this area is usually published in peer-reviewed journals and there are a relatively large number of systematic reviews summarizing the evidence. The knowledge base in this area is also based on reports and evaluations from authorities and foundations. Studies in this area have been published from many different countries around the world, but with a preponderance of English-speaking countries. There are relatively few published Swedish studies, but the number is growing steadily.

An overall assessment of the research clearly shows that students have positive effects on, among other things, learning, working memory, concentration, personal and social development, health, physical activity and motivation when teaching partly takes place outdoors, preferably in green environments. Increased outdoor teaching does not lead to poorer results in theoretical subjects. On the contrary, a positive effect can be seen in the subject areas of mathematics, language and science through outdoor education (Faskunger et al., 2018). Some studies have also raised the



concern that an increased focus on teaching theoretical subjects indoors risks leading to increased ill health, poorer learning, more unequal conditions for teaching students. There is a need for more higher quality scientific studies in this area.

Existing systematic reviews examining the effects of outdoor recreation and nature contact on learning and development are presented in Appendix 1.

## The link between outdoor recreation, health and learning

Outdoor education in schools has a wide range of positive effects for students compared to if all teaching takes place indoors, according to a recent knowledge review where some 30 systematic reviews and meta-analyses were included (Faskunger et al., 2018). The overall knowledge base is relatively good and shows that outdoor education has positive effects on students' learning and school performance, as well as health and well-being, personal and social development. Outdoor education in school leads to improved cognition, concentration, working memory, self-control, impulse control, increased creativity, ability to cooperate, study motivation and improved motor ability compared to if all teaching takes place indoors. In addition, the students' physical activity increased and time spent sedentary decreased. A systematic review in the report showed that students' results in theoretical subjects were not made worse by more outdoor teaching – quite the opposite. Increased outdoor teaching and increased physical activity seem to improve students' results in theoretical subjects (Faskunger et al., 2018). At the same time, it is important to point out that higher quality studies are needed to raise the evidence in the field (e.g. Becker et al., 2017) and in what contexts and in which course elements it is most appropriate to place teaching outdoors (Mann et al., 2022).

Another important aspect of being able to live an active recreation and outdoor recreation is good motor skills. Increased outdoor living and outdoor education promote motor skills in children. Good motor skills are strongly associated with high cognitive ability, school performance and development during adolescence, according to Swedish groundbreaking research that has followed pupils throughout compulsory school (Ericsson, 2017). Good motor skills are at least as important for cognition and school performance as more established influencing factors such as the child's intelligence quotient and socioeconomic background (Diamond & Ling, 2016). Children with low motor skills have poorer perceived competence for movement, lower oxygen uptake, lower muscle strength, poorer muscular endurance and poorer and more unhealthy weight status (Vedul-Kjelsås et al., 2015). Children's opportunities to engage in physical activity and outdoor recreation in adulthood will be worse compared to their peers with better motor skills, which increases the risk of high societal costs, ill health and human suffering in the future.

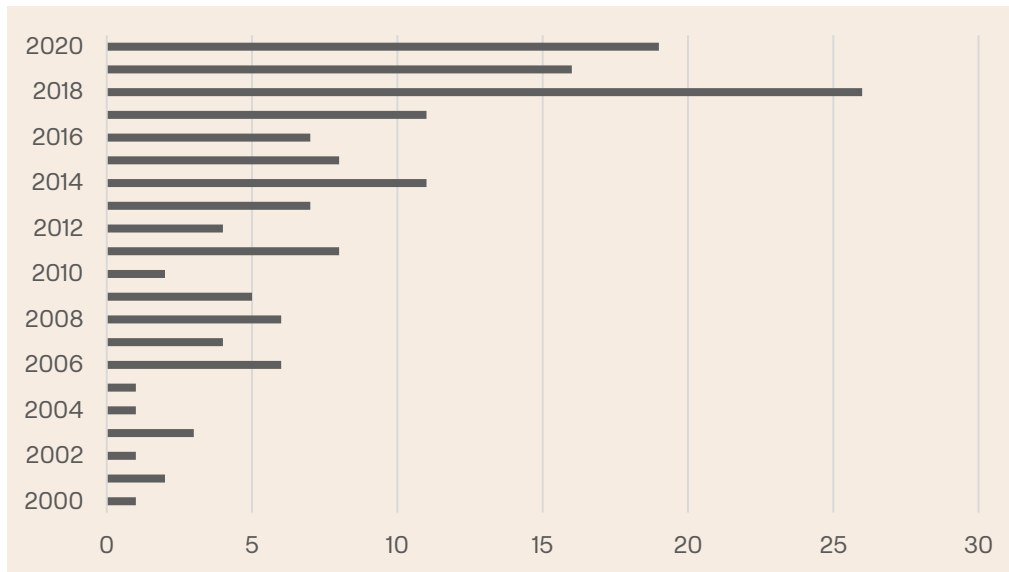
Outdoor education also seems to lead to better results in theoretical school subjects, for example in science, different languages and mathematics. Almost no reviews show any negative results and relatively few studies have so-called null results, that is, where studies show neither positive nor negative results (Faskunger et al., 2018).

Children at preschools with a high proportion of greenery and nature have better motor skills and ability to concentrate, have fewer sick days and are healthier than children at nature-poor preschools according to Swedish research (cited by the National Institute of Public Health, 2009). Physical activity, both occasional moments of movement and regular physical activity over time, has positive effects on cognition, brain structure, brain function and school outcomes for children and adolescents with and without various medical diagnoses (Bailey et al., 2009; Rasberry et al., 2011; Fedewa & Ahn, 2011; Singh et al., 2012; Estaban-Cornejo, 2014; Donnelly et al., 2016; Bangsbo et al., 2016).

A systematic review of research from English-speaking countries, by Fiennes et al. (2015), provided strong support for positive effects of outdoor education on students' school performance compared to other students. All included studies (N=58) reported positive effects, such as improved skills in science subjects, higher motivation to learn, increased physical activity, improved eating habits and increased self-confidence. More detailed and time-longer programmes achieved higher effects than short and sporadic interventions. Several reviews (e.g., Fiennes et al., 2015; Becker et al., 2017), as well as the knowledge overview by Faskunger et al. (2018), point to a great need for evaluations with longer follow-up and more experimental design as many evaluations are short and lack a control group.

A recently published review by Mann et al. (2022) shows that the number of published high-quality studies in the field has increased dramatically in recent years – as presented in the chart below.

Chart: Number of published high-quality scientific studies investigating the effects of outdoor education, 2000–2020. The studies were included in the systematic review by Mann et al. (2022).



## Exposure to nature and green education

Some systematic reviews have studied the effects of nature contact in the school world among students. A systematic review by Gill et al. (2011) found strong support that students who participate in "green" outdoor education improve their learning ability and develop healthier eating habits compared to other students. Experience of green environments in teaching had a strong correlation with higher environmental awareness. There was relatively strong support that schools with regular green outdoor education and schools with official forest schools increased students' social skills compared to control schools where all teaching took place indoors. Furthermore, students with outdoor education showed a higher degree of self-control, better subject knowledge and strengthened self-awareness. Play in natural environments developed preschool children's motor skills and fitness to a greater extent than children in schools without natural environments adjacent to the schoolyard.

A 2013 review reported effects on learning through 'green' outdoor learning on and near school grounds (Williams & Scott, 2013). They found 48 original studies of approved quality. As many as 83 percent of the studies had positive and significant results for the students who received outdoor education compared to the group who only had indoor education. Only one study (3%) reported a negative result with outdoor education, namely poorer perceived cohesion between pupils at school.

"Green" outdoor teaching seemed especially effective in science subjects, where 93 percent of studies had a positive and significant result. In mathematics and languages, the corresponding proportions were 80 and 72 per cent, respectively. An overall explanation for the positive results was that students perceived outdoor education as a reality-based effective way to explain theoretical topics and put teaching indoors in a concrete context. In

addition, a total of 87 percent of included studies reported a positive association between outdoor teaching and regular and higher physical activity among students (Williams & Scott, 2013). The outdoor environment also gave the teachers the opportunity to learn things together with the students and changed the role of the educator compared to teaching indoors.

The systematic review by Davies et al. (2013) provides strong support that outdoor education promotes pupils' academic performance and creative ability, including through better group collaboration, higher pupil motivation, increased satisfaction with teaching, and increased concentration and attention during lessons. There was also evidence that creative environments – which are usually outdoor environments – promote the emotional and social development of children and young people.

It is well established that children who are "surrounded" – at home, at school and on their way to school – by green spaces and nature have a positive effect on cognitive ability (Dadvand et al., 2015). One factor that has not received as much attention in this context is the negative effect of air pollution on children's development. Air pollution seems to negatively affect cognition. The positive effect of greenery and exposure to nature on cognitive ability can partly be explained by lower exposure to air pollution in urban environments as green spaces (shrubs and trees among others) effectively filter out large parts of such pollutants (Dadvand et al., 2015). Greenery, nature and outdoor recreation can thus be a countervailing factor for equal learning and development among children and young people in society.

## Effects of organized outdoor recreation

Organized outdoor recreation or similar programmes have also been found to have important effects on learning and development. Higgins (2013) systematic review of residential nature adventure programmes on ordinary school students showed clear and consistently positive effects on academic learning and increased self-confidence among students. Students who participated in the adventure programmes made progress equivalent to three months of schoolwork on average. Programmes that lasted longer (at least one week and included overnight stays) and were nature-based achieved higher impact compared to shorter programmes and did not include as much stay in outdoor recreation areas. These programmes are considered to be similar to the activities of many outdoor organizations in Sweden, for example within the Scouts, Sportfiskarna and Friluftsförbundet.

Most research in outdoor education and outdoor recreation has focused on pupils from compulsory school and preschool. There is a poorer knowledge base about the effects of outdoor education on secondary school students or later in the educational steps. An exception is the study by Allan &

McKenna (2019) who used outdoor adventure programmes to improve the skills, motivation and "resilience" of 2500 newly admitted university students in England. A major problem in higher education is that students end their studies prematurely when they encounter difficulties and problems. The study showed that the students increased motivation and resilience to continue their studies through participation in outdoor adventure programmes. A significantly larger proportion of students completed their studies compared to the control group. The authors of the study concluded that adventure programmes in outdoor areas and based on group and collaborative activities can be a cost-effective method to increase the number of students who complete their studies.

## 8. Effects on Health and Well-Being of Access to Nature and Recreation Areas

### Introduction

Municipalities and other actors at the local and regional level have important roles in promoting proximity and accessibility to outdoor recreation areas and in promoting conditions for outdoor recreation. To generally create good conditions for being outdoors is important as being outdoors doubles the level of physical activity in people compared to staying indoors (Martin et al. (2022). Urban and regional planning is very much about spatial planning, but also about priorities, resource allocation and collaboration. Especially qualities such as proximity, accessibility and usability of recreation areas can be influenced by the municipalities.

The research programme *Friluftsliv i förändring* (Outdoor Recreation in Change) examined municipal planning for outdoor recreation. Between 181–213 municipalities responded to the questions about municipal planning (Petersson Forsberg, 2009). A total of 92 percent of Sweden's municipalities state that they use outdoor activities and outdoor recreation areas in their marketing. 38 percent of municipalities market their municipality by, among other things, highlighting access to quiet areas (Petersson Forsberg, 2009).

In recent years, the proportion of municipalities that state that they prioritize outdoor recreation and use outdoor recreation areas in their planning and marketing has increased (Swedish Environmental Protection Agency, 2022). The above results show that outdoor recreation and outdoor recreation areas are attractive values for municipalities, for example to attract new residents and promote tourism.

Almost everyone in society is positive to investments in outdoor recreation areas. According to the Swedish population, outdoor recreation areas are very popular and well worth developing to facilitate a physically active life. In the municipalities, leisure surveys are regularly conducted that show what people want the municipality to invest in. Outdoor recreation areas often come out on top – even among people who are not themselves very physically active or regularly visit those areas (Faskunger, 2011). The surveys show that what residents want and regularly use are simple and inexpensive facilities such as outdoor recreation areas, jogging tracks and hiking trails. Other important factors are that the residential area should be child-friendly and that it should be close to public meeting places.

### Access and proximity to recreation areas

Municipalities and authorities at different levels can promote outdoor recreation by ensuring that residents have a good range of close, accessible and attractive outdoor recreation areas in their planning. The proportion of

space for outdoor recreation and recreation in a residential area is an important determinant, for outdoor recreation and other forms of physical activity, for preventing overweight and obesity and many other common diseases such as cardiovascular diseases, type 2 diabetes, stroke, and hypertension in adults (Durand et al., 2011; WHO, 2016). Access and proximity, together with good accessibility, are the primary factors in promoting high use of outdoor recreation areas, although many other factors also come into play.

Parks and outdoor recreation areas are also important elements of a residential area or city to improve the shape of the city, preserve natural environments, promote biodiversity, offer nature experiences to people, reduce the harmful effect of air pollution, and promote physical activity, sport and exercise. Parks and outdoor recreation areas also promote social relationships and encounters, including among the elderly (WHO, 2016). Social isolation among older people is a significant risk factor for premature death (Steptoe et al., 2013). Outdoor recreation areas and other types of greenery have an important role to play in ensuring that residents perceive their local environment as peaceful and attractive, which in turn increases the propensity to engage in outdoor activities and other forms of physical activity. People who perceive their immediate environment as peaceful and attractive for movement are significantly more physically active than those who perceive the immediate environment as anxious and unattractive. The relationship is independent of individual factors, such as socioeconomic background (Faskunger & Sjöblom, 2017). People with poor access to recreational areas are at higher risk of developing cardiovascular diseases (WHO, 2016).

An interesting study found that walking in recreation areas lowered heart rate and blood pressure more than walking on urban streets. The study recommended that walks in recreation areas should be used, among other things, as a strategy in the rehabilitation of cardiovascular patients (Grazuleviciene, et al., 2015). A systematic review published in 2011 (Lachowycz & Jones, 2011) found strong evidence that good access to recreation areas in residential areas lowered the risk of overweight and obesity among residents, thanks in part to better conditions for walking and being outdoors locally.

## Effects on children

Children are particularly interesting to study in order to investigate the connections between proximity to outdoor recreation areas and different public health outcomes because they have not chosen their place of residence, their lifestyle habits are modifiable and most children's outdoor activities are about being outdoors near home and in the residential area. Proximity to and use of public nature and outdoor recreation areas promotes children's mental, social, physical and motor development.

Staying in such areas promotes children's ability to concentrate, physical activity and they stay healthier. Children in activity-friendly neighbourhoods (where outdoor recreation areas are an important piece of the puzzle) engage in an average of 10 minutes more physical activity per day, compared to children in neighbourhoods that are less physically active (Jerrett et al., 2011).

Living near green spaces has a strong positive correlation with higher likelihood of physical activity, better mental health and better emotional and impulse control for children and young people with and without special diagnoses. A systematic review by Gill et al. (2011) also found strong support for children who are regularly exposed to nature during their formative years having an increased environmental awareness and greater sense of the nature of the local community as adults. Perceived safety in the outdoor environment is an important factor for children's physical activity and freedom of movement (WHO, 2016; Lambert et al., 2019), which was also stated in a Swedish thesis from Lund (Weiman, 2017).

## The role of local governments in promoting outdoor recreation

Efforts to prevent ill health and diseases have traditionally been handled by the health care system. But other actors such as municipalities and counties also have important roles to play. Municipalities and counties can, among other things, prevent premature death in the population by investing funds in expanding access to, and developing, outdoor recreation areas. A large US study from 2019 showed a significant decline in mortality in county overtime as access and financial means to parks and recreation areas improved (Mueller et al., 2019) reducing costs. Parks and recreation areas promote population health by improving air quality (Kuo, 2015), reduce exposure to allergens (Ruokolainen, 2017), reduced stress/increased recovery (Shanahan et al., 2015, de Vries et al., 2013), increased social cohesion (de Vries et al., 2013), reduced risk of obesity (Mullenbach et al., 2017; Mueller et al., 2018), increased self-perceived health/quality of life (Mullenbach et al., 2017; Mueller et al., 2018) and reduce the risk of mental illness (Cox et al., 2017). A systematic review found that good access to recreational areas in the residential area promoted healthy weight development in newborns, even when controlling for other factors, which is an important factor for newborn health during the first years of life and most likely also later in life (Dzhambov et al., 2014).

Proximity to outdoor recreation areas and activity-friendly residential areas promotes walking and cycling, and increases freedom of movement for children, young people and groups with reduced mobility such as the elderly. Studies controlling for individual factors shows that residents of communities with a high "density" of supply and services, but also parks and outdoor recreation areas, walk more, weigh less and have a lower risk of



obesity, high blood pressure and many chronic diseases, in comparison with residents in more "dispersed" communities (Faskunger & Sjöblom, 2017). Features that increase the use of outdoor recreation areas include: good maintenance, high accessibility, absence of debris, graffiti and vandalized buildings and objects, quiet places and areas, relevant supply and service, aesthetically attractive places and surfaces and that the area feels safe and secure (McCormack et al., 2010).

## 9. References

- Abraham, A (2010) Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments. *International Journal of Public Health* 55(1):59–69
- Allan, JF & McKenna, J (2019). Outdoor Adventure Builds Resilient Learners for Higher Education: A Quantitative Analysis of the Active Components of Positive Change. 7(5). pii: E122. doi: 10.3390/sports7050122.
- Andersen, Z m.fl. (2015) A study of the combined effects of physical activity and air pollution on mortality in elderly urban residents: the Danish diet, cancer, and health cohort. *Environmental Health Perspectives*, 123, 557-563.
- Andersson, K m.fl. (2013). Barns möte med naturen. I: Friluftsliv i förändring. Resultat från ett forskningsprogram. Slutrapport. Red: P Fredman, M Stenseke, K Sandell och A Mossing. Sid 115–130. Naturvårdsverket rapport 6547, Stockholm.
- Annerstedt, M m.fl. (2012). Green qualities in the neighbourhood and mental health – results from a longitudinal cohort study in Southern Sweden. *BMC Public Health*, 12, 337.
- Bailey, R m.fl. (2009). The educational benefits claimed for physical education and school sport: an academic review. *Research Papers in Education*, 24(1), 1–27.
- Balmford A, m.fl. (2015). Walk on the Wild Side: Estimating the Global Magnitude of Visits to Protected Areas. *PLoS Biol* 13(2): e1002074. doi:10.1371/journal.pbio.1002074
- Banay, R.F (2017). Residential greenness: current perspectives on its impact on maternal health and pregnancy outcomes. *International Journal of Womens Health* 9: 133–144.
- Bangsbo, J m.fl. (2016). The Copenhagen Consensus Conference 2016: children, youth, and physical activity in schools and during leisure time. *British Journal of Sports Medicine* 50 (19): sid 1177–1178.
- Barboza m.fl. (2021) Green space and mortality in European cities: a health impact assessment study. *Lancet Planet Health* Vol 5, 718–30.
- Barton, B. & Pretty J. (2010). What is the Best Dose of Nature and Green Exercise for Improving Mental Health? A Multi-Study Analysis. *Environmental Science and Technology*, 44(10), 3947–3955.
- Becker, C m.fl. (2017) Effects of Regular Classes in Outdoor Education Settings: A Systematic Review on Students' Learning, Social and Health Dimensions. *International Journal of Environmental Research in Public Health*. 2017 May 5;14(5).
- Bennett, J (2014). Gifted places: the inalienable nature of belonging in place. *Environment and Planning D: Society and Space*, 32(4), 658–671. <https://doi.org/10.1068/d4913p>
- Bergström, H m.fl. (2017) Insatser för att främja hälsosamma matvanor och fysisk aktivitet En kartläggande litteraturöversikt. Karolinska Institutet, Stockholm.

- Berto, R (2014). The role of nature in coping with psycho-physiological stress: a literature review on restorativeness. *Behavioral Science* 4(4):394-409. doi: 10.3390/bs4040394.
- Biswas, A., m.fl. (2015). Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults: a systematic review and meta-analysis. *Annals of Internal Medicine*. 162(2):123-32. doi: 10.7326/M14-1651.
- Blomdahl, U., Elofsson, S., & Åkesson, M. (2012) Spontanidrott för vilka? En studie av kön och nyttjande av planlagda utomhusytor för spontanidrott under sommarhalvåret. Idrottsförvaltningen, Stockholms stad. Stockholms universitet, Stockholm.
- Bodin, M & Hartig, T (2001). Does the outdoor environment matter for psychological restoration gained through running? *Psychology in Sport and Exercise* 4, 141-153.
- Boverket (2013). Planera för rörelse! En vägledning om byggd miljö som stimulerar till fysisk aktivitet i vardagen. [http://www.fot.se/documents/Planera\\_for\\_rorelse.pdf](http://www.fot.se/documents/Planera_for_rorelse.pdf). Karlskrona.
- Bowler, D., m.fl. (2010) Urban greening to cool towns and cities: A systematic review of the empirical evidence. *Landscape and Urban Planning*, 97, 147-155.
- Bowles, N., & Dougherty, J. (2019). Effects of a Nature-Based Preschool Curriculum on Children's Executive Functioning. *Child & Youth Care Forum*, 48(5), 619-638.
- Britton, E., m.fl. (2020) Blue care: a systematic review of blue space interventions for health and wellbeing. *Health Promot Int*. Feb 1;35(1):50-69. doi: 10.1093/heapro/day103.
- Broekhuizen, K., m.fl. (2013) Healthy aging in a green living environment: a systematic review of the literature. TNO Leiden. Available at: <https://www.tno.nl/media/1647/2013tno-r10154-healthy-aging-in-a-green-living-environment-def-samenvatting-2.pdf>.
- Cahill, S.M., m.fl. (2020) Activity- and Occupation-Based Interventions to Support Mental Health, Positive Behavior, and Social Participation for Children and Youth: A Systematic Review. *Am J Occup Ther*. 2020 Mar/Apr;74(2):7402180020p1-7402180020p28.
- Childs, C. E., & Richards, S. E. (2018). The effect of outdoor adventure education on student mental health. *Journal of Adventure Education and Outdoor Learning*, 18(3), 259-269.
- Cuo, K., m.fl. (2020). Significance of Outdoor Time for Myopia Prevention: A Systematic Review and Meta-Analysis Based on Randomized Controlled Trials. *Ophthalmic Research*. 2020;63(2):97-105. doi: 10.1159/000501937.
- Capaldi, C.A., m.fl. (2014) The relationship between nature connectedness and happiness: a meta-analysis. *Frontiers in Psychology* 5: 976.
- Chaput, J.P (2018) Outdoor time and dietary patterns in children around the world. *Journal of Public Health* 40(4):e493-e501.
- Cianga, N & Popescu, A (2013) Green spaces and urban tourism development in Craiova municipality in Romania. *European Journal of Geography*, 4, 34-45.

Coalter, F., Dimeo, P., Morrow, S. & Taylor, J. (2010). The Benefits of Mountaineering and Mountaineering Related Activities: A Review of Literature. A Report to the Mountaineering Council of Scotland. Department of Sports Studies, University of Stirling, Storbritannien.

Cox, D m.fl. (2017). Doses of neighborhood nature: the benefits for mental health of living with nature. *Bioscience*, 67 (2) sid. 147-155.

Coutts, C & Hahn, M (2015) Green Infrastructure, Ecosystem Services, and Human Health. *International Journal of Environmental Research in Public Health*. 12(8): 9768–9798.

Crouse, D.L (2019). Complex relationships between greenness, air pollution, and mortality in a population-based Canadian cohort. *Environmental Int.*128:292–300.

Currie, D., & Johnston, G. (2019). Outdoor learning and its impact on behaviour: A systematic review of research in primary and secondary schools. *Journal of Adventure Education and Outdoor Learning*, 19(1), 73–88.

Dankiw, KA m.fl. (2020). The impacts of unstructured nature play on health in early childhood development: A systematic review. *PLoS One*. 15(2):e0229006. doi: 10.1371/journal.pone.0229006.

Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P. & Howe, A. (2013). Creative Learning Environments in Education – a systematic literature review. *Thinking Skills and Creativity*, 8, 80–91.

Dettweiler, U med flera (2019). Effects of a physical education-inspired outdoor education program on motor skills and executive functions in primary school children. *Journal of Sport and Health Science*, 8(3), 261–270.

de Vries, S.M. Van Dillen, P.P. Groenewegen, P. (2013) Streetscape greenery and health: stress, social cohesion and physical activity as mediators. *Social Science & Medicine*, 94, sid. 26–33, 10.1016/j.socscimed.2013.06.030

Diamond A & Ling, D (2016). Conclusions about interventions, programs, and approaches for improving executive functions that appear justified and those that, despite much hype, do not. *Developmental Cognitive Neuroscience* 18, 34–48.

Donnelly, J.E., m.fl. (2016) Physical Activity, Fitness, Cognitive Function, and Academic Achievement in Children: A Systematic Review. *Medicine and Science in Sports and Exercise* Jun;48(6):1197–222.

Dzhambov, A., m.fl. (2014) Association between residential greenness and birth weight: Systematic review and meta-analysis. *Urban Forestry & Urban Greening* 13, 621-629.

Durand, C. P., m.fl. (2011). A systematic review of built environment factors related to physical activity and obesity risk: implications for smart growth urban planning. *Obesity Reviews*, 12(5):e173–82.

Eigenschenk, B., m.fl. (2019) Benefits of Outdoor Sports for Society. A Systematic Literature Review and Reflections on Evidence. *International Journal of Environmental Research in Public Health*; 16(6): 937. Doi: 10.3390/ijerph16060937.

Elmqvist T m.fl. (2015). Benefits of restoring ecosystem services in urban areas. *Current opinion in Environmental Sustainability* 14: 101-108.

Engemann, K. m.fl. (2019) Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood. *PNAS* 12, 116 (11) 5188-5193.

Ericsson, I. (2011). Effects of increased physical activity on motor skills and marks in physical education: an intervention study in school years 1 through 9 in Sweden. *Physical Education and Sport Pedagogy*, 16 (3), sid. 313-329.

Ericsson, I. (2017). Betydelsen av fysisk aktivitet och motorisk kompetens för lärande. I: *Idrottens samhällsnytta – En vetenskaplig översikt av idrottsrörelsens mervärden för individ och samhälle*. Sid.67-81. Red. Johan Faskunger & Paul Sjöblom. Riksidrottsförbundet, Stockholm.

Esteban-Cornejo, I., m.fl. (2014). Physical activity and cognition in adolescents – A systematic review. *Journal of Science and Medicine in Sport*. September 2015, volume 18, issue 5, pp. 534-539.

Faskunger, J (2011) Spontanidrottsanläggningar och miljöer. En utmaning för samhällsplaneringen. *Sveriges Kommuner och Landsting. Riksidrottsförbundet*. Stockholm.

Faskunger, J (2013) *Fysisk aktivitet och folkhälsa*. Studentlitteratur, Lund.

Faskunger, J & Sjöblom, P (2017). Anläggningar och andra miljöer för idrott: när, hur och varför är de samhällsnyttiga? I: *Idrottens samhällsnytta: En vetenskaplig översikt av idrottsrörelsens mervärden för individ och samhälle*. Sid: 191-212. Red: Johan Faskunger & Paul Sjöblom. Riksidrottsförbundet, Stockholm.

Faskunger, J m.fl. (2018) Klassrum med himlen som tak. En kunskapsöversikt om vad utomhusundervisning betyder för lärande i grundskolan. *Skrifter från Forum för ämnesdidaktik nr 10*. Linköpings universitet, Linköping.

Fedewa A.L., & Ahn, S. (2011). The effects of physical activity and physical fitness on children's achievement and cognitive outcomes: a meta-analysis. *Research quarterly for exercise and sport*, 82(3), pp. 521-535.

Fiennes, C., m.fl. (2015). *The Existing Evidence-Base about the Effectiveness of Outdoor Learning*. Institute of Education & Giving Evidence & Institute for Outdoor Learning & The Blagrove Trust. Storbritannien.

Folkhälsomyndigheten & Sveriges Kommuner och Landsting (2019) *Öppna jämförelser 2019*. Stockholm.

Fredman, P. m.fl. (2008). *Friluftslivets ekonomiska värden – en översikt*. Rapport till Svenskt friluftsliv. Östersund, Alnarp och Umeå.

Fredman, P. m.fl. (2013). Friluftslivet i samhällsekonomin. Friluftsliv i förändring. Resultat från ett forskningsprogram. Slutrapport. Sid 161-174. Red: Fredman, P, Stenseke, M & Mossing, A. Rapport 6547, Stockholm.

Gentin, S. m.fl. (2019). Nature-based integration of immigrants in Europe: A review. *Urban Forestry & Urban Greening* 43, 126379.

Gentin, S (2011). Outdoor recreation and ethnicity in Europe—A review. *Urban Forestry & Urban Greening*, 10(3), 153–161. <https://doi.org/10.1016/j.ufug.2011.05.002>

Ghebreyesus, T (2022) Hälsa och klimat. I boken: Klimatboken. Redaktör Greta Thunberg. Sid 134-139. Polaris förlag.

Gill, T. (2011). Children and nature – A Quasi-systematic review of the empirical evidence. Greater London Authority, UK.

Gill, T. (2014). The Benefits of Children’s Engagement with Nature – A Systematic Literature Review. *Children, Youth and Environments*, 24(2).

Glover, N & Polley, S (2019). GOING GREEN: The Effectiveness of a 40-Day Green Exercise Intervention for Insufficiently Active Adults. *Sports* 13;7(6). pii: E142. doi: 10.3390/sports7060142.

Grahn, K (2017). Jämställdhet en förutsättning för idrottens samhällsnytta. I: *Idrottens samhällsnytta: En vetenskaplig översikt av idrottsrörelsens mervärden för individ och samhälle*. Sid: 101-117. Red: Johan Faskunger & Paul Sjöblom. Riksidrottsförbundet, Stockholm.

Gratton, C. m.fl. (2018). Economic value of community club-based sport in Australia. Australian Sports Commission and Griffith University, Queensland.

Grazuleviciene, R m.fl. (2015) The Effect of Park and Urban Environments on Coronary Artery Disease Patients: A Randomized Trial. *BioMed Research International*, 2015, 9.  
Greenspace Scotland (2008). *Greenspace and quality of life: a critical literature review*. Stirling, Skottland.

Gren I.M & Isacs L (2009). Ecosystem services and regional development: An application to Sweden. *Ecological Economics* 68, 2549-2559.

Gustavsson, M., m.fl. (2018). Quantification of population exposure to NO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> and estimated health impacts. Rapport C 317. IVL Umeå universitet. Naturvårdsverket, Stockholm.

Hadders, A & Rosengren, A (2006). Får man grilla här?: kulturell mångfald möter biologisk mångfald : rapport från pilotprojekt Kristianstad. Rapport 2006:67. Regionmuseet Kristianstad/Landsarkivarien Skåne.

Hagberg, L (2017) Hälsoekonomiska aspekter av idrott. Sid 40-59. I rapporten *Idrottens samhällsnytta*. Red: Johan Faskunger & Paul Sjöblom. Riksidrottsförbundet, Stockholm.

Haraldsson, A-L (2012). Könstraditioner och ”det nya friluftslivet”. Friluftsliv i förändring. Resultat från ett forskningsprogram. Rapport 22, Stockholm.

Haluza, D (2014) Green Perspectives for Public Health: A Narrative Review on the Physiological Effects of Experiencing Outdoor Nature. *International Journal of Environmental Research in Public Health* 11(5): 5445–5461.

Higgins, S., Katsipataki, M., Kokotsaki, D., Coe, R., Major, L.E. & Coleman, R. (2013). The Sutton Trust-Education Endowment Foundation Teaching and Learning Toolkit – Technical Appendices. Education Endowment Foundation, London, UK.

Highfill, T & Franks, C (2019). Measuring the U.S. outdoor recreation economy, 2012–2016. *Journal of Outdoor Recreation and Tourism*, 27, 100233.

Hunter, R.F m.fl. (2015). The impact of interventions to promote physical activity in urban green space: A systematic review and recommendations for future research. *Social Science & Medicine* 124, 246–256.

International Society for Physical Activity and Health (ISPAH) (2022). ISPAH’s Eight Investments That Work for Physical Activity. Går att ladda ned från [www.ISPAH.org/Resources](http://www.ISPAH.org/Resources)

Janssen, X m.fl. (2020). Associations of screen time, sedentary time and physical activity with sleep in under 5s: A systematic review and meta-analysis. *Sleep Medicine Reviews*. 49: 101226

Jerrett, M., Almanza, E., Davies, M., Wolch, J., Dunton, G., Spruitj-Metz, D., & Ann Pentz, M. (2013). Smart growth community design and physical activity in children. *American Journal of Preventive Medicine*, Oct; 45(4): 386–92.

Johansson, E (2007). Mångnatur. Friluftsliv och natursyn i det mångkulturella samhället. Mångkulturellt centrum & Naturvårdsverket, Stockholm.

Kay, T m.fl. (2018) A systematic review of outdoor recreation (in green space and blue space) for families to promote subjective wellbeing. Culture and Sport Evidence Programme. What Works Centre for Wellbeing. [www.whatworkswellbeing.org](http://www.whatworkswellbeing.org).

Keniger, L.E. m.fl. (2013) What are the Benefits of Interacting with Nature? *International Journal of Environmental Research in Public Health* 10(3), 913–935.

Kriemler, S., m.fl. (2011). Effect of school-based interventions on physical activity and fitness in children and adolescents – a review of reviews and systematic update. *British Journal of Sports Medicine*. 45(11); pp. 923–30.

Kondo m.fl. (2018). Does spending time outdoors reduce stress? A review of real-time stress response to outdoor environments. *Health Place*. 51:136–150.

Kolu, P m.fl. (2022) Economic burden of low physical activity and high sedentary behaviour in Finland. *J Epidemiol Community Health* 76(7):677–684. doi: 10.1136/jech-2021-217998. Epub 2022 Apr 26.

Kuo M. (2015). How might contact with nature promote human health? Promising mechanisms and a possible central pathway. *Front. Psychol.* 2015;6:1093.

Lackey, N.Q. m.fl. (2019) Mental health-benefits of nature-based recreation: a systematic review. *Annals of Leisure Services*, DOI: 10.1080/11745398.2019.1655459.

Lahart, I m.fl. (2019) The Effects of Green Exercise on Physical and Mental Wellbeing: A Systematic Review. *International Journal of Environmental Research in Public Health*. 2019 Apr 15;16(8).

Lakhani, A m.fl. (2019). Using the natural environment to address the psychosocial impact of neurological disability: A systematic review. *Health Place*. 55:188–201.

Lambert, A (2019). What Is the Relationship between the Neighbourhood Built Environment and Time Spent in Outdoor Play? A Systematic Review. *International Journal of Environmental Research in Public Health*. 16(20).

Langford, R. m.fl. (2014). The WHO Health Promoting School framework for improving the health and well-being of students and their academic achievement. *Cochrane Database of Systematic Reviews*. Nr 4. Artikel nr: CD008958.

Lee, A.C.K (2015) Value of urban green spaces in promoting healthy living and wellbeing: prospects for planning. *Risk Management in Healthcare Policy*. 8: 131–137.

Lee, I-M m.fl. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet* 380 (9838): 219–229.

Lisberg Jensen, E & Ouis, P (2014). *Det gröna finrummet: etnicitet, friluftsliv och naturumgängets urbanisering*. Carlssons förlag, Malmö.

Lundmark, L m.fl. (2013) När friluftsliv blir naturturism. *Friluftsliv i förändring. Resultat från ett forskningsprogram. Slutrapport*. Sid 175–190. Red: Fredman, P, Stenseke, M & Mossing, A. Rapport 6547, Stockholm.

Lynch, M., m.fl. (2020) A Systematic Review Exploring the Economic Valuation of Accessing and Using Green and Blue Spaces to Improve Public Health. *Int J Environ Res Public Health*. Jun 10;17(11):4142. doi: 10.3390/ijerph17114142.

MacBride-Stewart, S m.fl. (2016). Exploring the interconnections between gender, health and nature. *Public Health* 141, 279–286.

Malm, C & Isaksson (2017) *Idrott – en viktig faktor för fysisk och psykisk hälsa*. I rapporten *Idrottens samhällsnytta*. Red: Johan Faskunger & Paul Sjöblom. Riksidrottsförbundet, Stockholm.



Malone, K. & Waite, S. (2016) Student outcomes and natural schooling. Pathways from evidence to impact report 2016. Plymouth University, UK, and Western Sydney University, Australia.

Manferdelli, G m.fl. (2019). Outdoor physical activity bears multiple benefits to health and society. *Journal of Sports and Medicine in Physical Fitness*. 2019 May;59(5):868–879.

Mann, J (2022) Getting Out of the Classroom and Into Nature: A Systematic Review of Nature-Specific Outdoor Learning on School Children's Learning and Development. *Front Public Health*. 16;10:877058.doi: 10.3389/fpubh.2022.877058. eCollection 2022

Marini, S (2022) The Effect of Physical Activity Interventions Carried Out in Outdoor Natural Blue and Green Spaces on Health Outcomes: A Systematic Review. *Int J Environ Res Public Health*. Sep 30;19(19):12482. doi: 10.3390/ijerph191912482.

Martin, A., m.fl. (2022) Environmental and practice factors associated with children's device-measured physical activity and sedentary time in early childhood education and care centres: a systematic review. *Int J Behav Nutr Phys Act* 2022 Jul 4;19(1):84. doi: 10.1186/s12966-022-01303-2.

McCormack, G m.fl. (2010) Characteristics of urban parks associated with park use and physical activity: a review of qualitative research. *Health & Place*, 16, 712-726.

McCormick, R (2022) Does Access to Green Space Impact the Mental Well-being of Children: A Systematic Review. *J Pediatr Nurs* DOI: 10.1016/j.pedn.2017.08.027

McCullough, M.P. m.fl. (2018). The Impact of Sport and Outdoor Recreation (Friluftsliv) on the Natural Environment. MISTRA - the Swedish Foundation for Strategic Environmental Research. Stockholm.

McMahan, E.A & Estes, D (2015) The effect of contact with natural environments on positive and negative affect: A meta-analysis. *The Journal of Positive Psychology* 10(6), 507-519.

Mitchell, R & Popham, F (2008). Effect of exposure to natural environment on health inequalities: an observational population study. *The Lancet* 372(9650): 1655-1660.

Mitten, D m.fl. (2016). Hiking: A Low-Cost, Accessible Intervention to Promote Health Benefits. *American Journal of Lifestyle Medicine* 12(4):302-310. doi: 10.1177/1559827616658229.

Mueller J.T., Park S.Y., Mowen A.J. The relationship between self-rated health and local government spending on parks and recreation in the United States from 1997 to 2012. *Prev. Med. Rep.* 2018;13:105–112.

Mueller, J.T. m.fl. (2019) The relationship between parks and recreation per capita spending and mortality from 1980 to 2010: A fixed effects model. *Preventive Medicine Reports*, 14.

Mullenbach L.E. m.fl. (2018). Assessing the relationship between a composite score of urban park quality and health. *Preventing Chronic Diseases* 15:180033.

Mushtat, Y (2008). Med andra ögon. Naturmöten med invandrare. Naturvårdsverket, rapport 5808.

Mårtensson, F. m.fl. (2011). Den nyttiga utevistelsen? – Forskningsperspektiv på naturkontaktens betydelse för barns hälsa och miljöengagemang. Rapport 6407. Naturvårdsverket, Stockholm.

Mårtensson, F (2012). Plats för fri äventyrlig fysisk aktivitet i Malmö. Malmö Stad.  
National Institute of Clinical Excellence (2008). Promoting and creating built or natural environments that encourage and support physical activity. NHS, UK. <http://tools.nisb.nl/beleidsinstrumenten/bravo-kompas/stap-1-draagvlak/nice-promoting-and-creating-built-ornatural-environments.pdf>

Naturvårdsverket (2006). Naturen som kraftkälla. Om hur och varför naturen påverkar hälsan. Stockholm.

Naturvårdsverket (2013). Friluftsliv i förändring. Resultat från ett forskningsprogram. Slutrapport. Red: Fredman, P, Stenseke, M & Mossing, A. Rapport 6547, Stockholm.

Naturvårdsverket (2017). Argument för mer ekosystemtjänster. Rapport 6736. Stockholm.

Naturvårdsverket (2019). Friluftsliv 2018. Rapport 6887. Stockholm.

Naturvårdsverket (2022) Sveriges friluftskommun 2022. Rapport 7050. Stockholm.

Neville, A.R (2019) "A place to call our own": The impact of camp experiences on the psychosocial wellbeing of children and youth affected by cancer – A narrative review. *Complement Ther Clin Pract.* 36:18-28.

Norling, I & Larsson, E-L (2004) Ett gott och friskare liv som äldre.

Nyberg, G (2017). Få unga rör på sig tillräckligt. I: De aktiva och de inaktiva. Om ungas rörelse i skola och på fritid. Sid 27-42. Red: Christine Dartsch, Norberg, J.R. & Pihlblad, J (2017). Centrum för Idrottsforskning. Rapport 2017:2. Stockholm.

Pagels, P., m.fl. (2014). A repeated measurement study investigating the impact of school outdoor environment upon physical activity across ages and seasons in Swedish second, fifth and eighth graders. *BMC Public Health.* 2014 Aug 7;14:803.

Peters, K m.fl. (2016). The role of natural environments in developing a sense of belonging: A comparative study of immigrants in the US, Poland, the Netherlands and Germany. *Urban Forestry & Urban Greening*, 17, 63–70. <https://doi.org/10.1016/j.ufug.2016.04.001>

Petersson Forsberg, L (2009). Friluftsliv och naturturism i kommunal planering. Forskningsprogrammet Friluftsliv i förändring, rapport nr 8. Blekinge tekniska högskola & Sveriges kommuner och landsting, Karlskrona/Stockholm.

Pettersson R & Wallstam M (2017) Idrottsevenemangs samhällsnytta. I rapporten: Idrottens samhällsnytta. Red: Johan Faskunger & Paul Sjöblom. Riksidrottsförbundet, Stockholm.

- Picton, C m.fl. (2020) Experiences of outdoor nature-based therapeutic recreation programs for persons with a mental illness: a qualitative systematic review. *JBI Evid Synth.* Sep;18(9):1820-1869. doi: 10.11124/JBISRIR-D-19-00263.
- Proper, K.I., m.fl. (2011). Sedentary behaviors and health outcomes among adults: a systematic review of prospective studies. *American Journal of Preventive Medicine* 40(2): 174-82.
- Rasberry, C m.fl. (2011). The association between school-based physical activity, including physical education, and academic performance: A systematic review of the literature. *Preventive Medicine*, 52(Suppl 1), 10-20.
- Regionplane- och trafikkontoret (2002). Rekreatiomsområden och sociala grupper. PM 10. Stockholm.
- Riksidrottsförbundet (2020). *Idrotten i siffror 2018*. Stockholm.
- Riksidrottsförbundet (2017). *Idrottens samhällsnytta: En vetenskaplig översikt av idrottsrörelsens mervärden för individ och samhälle*. Red: Johan Faskunger & Paul Sjöblom. RF, Stockholm.
- Ruokolainen L., m.fl. (2017) Holistic view on health: two protective layers of biodiversity. *Ann. Zool. Fenn.* 54:39-49.
- Saalensminde, K & Torkilseng, E (2010) *Vunne kvalitetsjusterte leveår (QALYs) ved fysisk aktivitet*. Helsedirektoratet, Oslo, Norge.
- Sandberg, M (2012). "De är inte ute så mycket" Den bostadsnära naturkontaktens betydelse och utrymme i storstadsbarns vardagsliv. Doktorsavhandling. Handelshögskolan, Göteborgs universitet.
- Sandell, K & Öhman, J (2013). An educational tool for outdoor education and environmental concern, *Journal of Adventure Education & Outdoor Learning*, 13:1, 36-55.
- Shanahan D.F., Fuller R.A., Bush R., Lin B.B., Gaston K.J. The health benefits of urban nature: how much do we need? *Bioscience*. 2015;65(5):476-485.
- Sheffield Hallam University & Sport England (2021) *Social and economic value of community sport and physical activity in England*. Storbritannien.
- Shindell (2022) *Luftföroreningar*. I boken: *Klimatboken*. Redaktör Greta Thunberg. Sid 140-142. Polaris förlag.
- Singh, A, m.fl. (2012). Physical Activity and Performance at School. A Systematic Review of the Literature Including a Methodological Quality Assessment. *Archives of Pediatric Adolescent Medicine*. 166(1), pp. 49-55. doi:10.1001/archPediatrics.2011.716.
- SMCI Associates. (2013). 'Living Wild - Chance for Change' Highland LEADER Programme - Evaluation Report. SMCI Associates, East Lothian.

Social & Health Impact Center (2022) Risk- och skyddsfaktorer – vad vet vi och vad kan göras med kunskapen? Länsstyrelsen Stockholm. Stockholm.

Socialstyrelsen (2011). Effekter av värmeböljor och behov av beredskapsåtgärder i Sverige Redovisning av ett regeringsuppdrag. Stockholm.

Socialstyrelsen (2013). Barn och ungas hälsa, vård och omsorg. Stockholm.

Statens folkhälsoinstitut (2009) Grönområden för fler – en vägledning för bedömning av närhet och attraktivitet för bättre hälsa. Östersund.

Stephens, A m.fl. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences USA*, 110, 5797-5801.

Stodolka, M., m.fl. (2016). Immigrants' Adaptation and Interracial/Interethnic Interactions in Natural Environments. *Leisure Sciences*. <https://doi.org/10.1080/01490400.2016.1213676>.

Stott, T., m.fl. (2015). Personal development on youth expeditions – A literature review and thematic analysis. *Leisure Studies*, 34(2), 197– 229.

Sveriges Kommuner och Landsting (2019) Klimatförändringarnas lokala effekter – exempel från tre kommuner. Stockholm.

Ståhl, A, m.fl. (2021) Häng med oss ut. Brukarrevision 2021 Utvärdering av projektet avseende åren 2018 – 2021. Brukarrevisorerna Samverkan Sydöst, Skåne.

The county health rankings & roadmaps program (2020). Community gardens. Robert Wood Johnson foundation. University of Wisconsin Population Health Institute, USA.

Thompson Coon, m.fl. (2011). Does Participating in Physical Activity in Outdoor Natural Environments Have a Greater Effect on Physical and Mental Wellbeing than Physical Activity Indoors? A Systematic Review. *Environ. Sci. Technol.* 2011;45:1761–1772. doi: 10.1021/es102947t

Tidball, K & Krasny, M (2014) Greening in the Red Zone: Disaster, Resilience and Community Greening. Springer Netherlands.

Tillväxtverket (2011). Resultat från den nationella gränsundersökningen IBIS 2011, inkommande besökare i Sverige. Rapport 0124, Stockholm.

Tillväxtverket (2015). Turismens årsbokslut. Stockholm.

Tillväxtverket (2018). Turismens årsbokslut. Stockholm.

Van den Bosch m.fl. (2015). Moving to serene nature may prevent poor mental health – results from a Swedish longitudinal cohort study. *International Journal of Environmental Research and Public Health*, 12, 7974-7989.

Vasankari, T m.fl. (2018). Costs of physical activity are increasing – the societal costs of physical inactivity and poor physical fitness. *Publications of the Government's analysis*,

assessment and research activities 31/2018. 70 s. (in Finnish). <http://tietokayttoon.fi/documents/10616/6354562/31-2018-Liikkumattomuuden+lasku+kasvaa.pdf/3dde40cf-25c0-4b5d-bab4-6c0ec8325e35?version=1.0>

Vedul-Kjelsås, V., m.fl. (2015). Physical fitness, self-Perception and physical activity in children with different motor competence. *European Journal of Adapted Physical Activity*, 8(1), 45–57.

Vicedo-Cabrera (2022) Hetta och sjukdom. I boken: Klimatboken. Redaktör Greta Thunberg. Sid 137–139. Polaris förlag.

Völker, S., Baumeister, H., Classen, T., Hornberg, C. & Kistemann, T (2013). Evidence for the temperature mitigating capacity of urban blue space – a health geographic perspective. *Erdkunde*, 67, 355–371.

Wagnsson, S. (2009) Föreningsidrott som socialisationsmiljö. En studie av idrottens betydelse för barns och ungdomars psykosociala utveckling. Doktorsavhandling. Karlstad: Karlstads universitet.

Wagnsson, S., & Augustsson, C. (2015) Idrottsföräldrars syn på den kommersialiserade barn- och ungdomsidrotten. I Dartsch, Norberg & Pihlblad (red.), *Idrottens Pris – Om idrottens kostnader och medlemskapets betydelse*. Centrum för idrottsforskning 2015:2.

Weimann, H. (2017). *Green neighbourhood environments – Implications for health promotion, physical activity and well-being* Lund: Lund University, Faculty of Medicine.

Wells, N. M. (2019). Health benefits of nature for children and adolescents. In *Nature-Based Strategies for Improving Urban Health and Wellbeing* (pp. 5-25). Springer.

White, M.P (2019). Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Scientific Reports* 9: 7730.

WHO, Regional office of Europe (2016) *Urban green spaces and health – A review of evidence*. Köpenhamn, Danmark.

WHO (2018). *Global action plan on physical activity 2018–2030: more active people for a healthier world*. Schweiz.

WHO, Regional office of Europe (2022) *Walking and cycling: latest evidence to support policy making and practice*. Danmark.

Wicks, C med flera (2022) Psychological benefits of outdoor physical activity in natural versus urban environments: A systematic review and meta-analysis of experimental studies. *Applied Psychology, Health and Well-being*, 14(3): 1037-1061.

Williams, D.P. & Dixon, S. (2013). Impact of Garden-Based Learning on Academic Outcomes in Schools: Synthesis of Research Between 1990 and 2010. *Review of Educational Research*. 83 (2), pp. 211-235.

Williams, F med flera (2016). The impact of an outdoor education programme on children and adolescents: A systematic review and meta-analysis. *Outdoor Education Research & Evaluation*, 22(1), 1-19.

Wolf-Watz, D., m.fl. (2013). Friluftsliv och miljöengagemang. Friluftsliv i förändring. Resultat från ett forskningsprogram. Slutrapport. Sid 145-159. Red: Fredman, P, Stenseke, M & Mossing, A. Rapport 6547, Stockholm.

World Organization of the Scout Movement (2019). Measuring Scouting's Impact on the Development of Young People – Phase II. Malaysia.

Wray, A., m.fl. (2020) Physical activity and social connectedness interventions in outdoor spaces among children and youth: a rapid review. *Health Promotion in Chronic Disease Prevention Canada* 40(4):104-115.

Zettersten, G (2007). Argument för friluftsliv. Friluftsrådet & Naturvårdsverket. Stockholm.

## Appendix 1: List of Systematic Reviews on Outdoor Education, Outdoor Recreation, Learning and Development

Huvudförfattare, årtal, typ av studie, utfallsmått:	Resultat & diskussion
Cason (1994), metaanalys. Vildmarksäventyr. Vanlig skolpopulation och riskungdomar. Självpuppfattning. Självkontroll. Kliniska skalor.	Genomsnittligt effektmått på 0.31. 12,2 % genomsnittlig förbättring för deltagande ungdomar, vilket motsvarar en förbättring på 62,2 % jämfört med icke-deltagande ungdomar. Tidsmässigt längre program och yngre deltagare innebar högre effektmått.
Hattie (1997), metaanalys, 96 originalstudier. Äventyr. Vanlig skolpopulation och riskungdomar och unga vuxna. Ledarskap; Självpuppfattning; Akademisk prestation; Personlighet; Interpersonella färdigheter. Sociala färdigheter. Äventyrslust/Djärvhet.	Genomsnittligt effektmått på 0.34 vid programmets slut. Effektmått vid senare uppföljning var 0.17. Utfallsmått (utfallsmått vid uppföljning inom parentes): Ledarskap: 0.38 (0.15). Self-concept: 0.28 (0.23). Akademisk prestation: 0.46 (0.21). Personlighet: 0.37 (0.14). Interpersonell: 0.32 (0.17). Äventyrslust: 0.38 (-0.06). Högst utfallsmått är relaterat till självkontroll: Oberoende: 0.47. Självförtroende: 0.33. Self-efficacy: 0.31. Självisikt: 0.34. Bestämmdhet: 0.42. Inre kontroll: 0.30. Beslutsfattande: 0.47.
Rickinson (2004b), systematisk översikt, 150 originalstudier. Äventyr. Vanlig skolpopulation, unga som begått brott, unga med emotionella och beteende-mässiga svårigheter.	Starka positiva effekter på attityder, värderingar, tro, interpersonella och sociala färdigheter genom utomhusundervisning baserat på äventyrsutflykter.  Positiva effekter finns även för akademiska färdigheter, positivt beteende, lägre risk för att återfalla i brott för barn och ungdomar med tidigare kriminell bakgrund, samt stärkt självbild.  Studien fann inget samband mellan äventyrsutflykter och en ökad miljömedvetenhet hos elever.
Neill (2008a), översikt över andra översikter (7 st). Äventyr. Vanlig skolpopulation, 5–18 år. Några barn hade speciella behov. Personlig och social utveckling.	På kort sikt gav programmen en måttlig effekt, 0.35. Det finns viss evidens för effekter även på lång sikt. 64 % av deltagarna i äventyrsprogrammen uppnådde signifikanta effekter jämfört med icke-deltagare.

<p>SMCI Associates (2013). Systematisk översikt. Utomhusprogram. Vildmarksäventyr. Unga som begått brott, högriskungdomar och unga med utsatt bakgrund.</p>	<p>Positiva effekter för ungdomar som tidigare dömts för brott samt för högriskungdomar. Lägre risk för återfall i brott. Positiva effekter på personliga och sociala färdigheter. Högre chans att få jobb för dessa ungdomar efter deltagande i programmen.</p>
<p>Neill (2008b), metaanalys. Äventyr i bebyggda miljöer. Vanlig skolpopulation.</p>	<p>Äventyrsprogram har låga till måttliga positiva effekter på vanliga utfallsmått såsom högre självuppfattning, lägre risk för beteendeproblem och bättre lagsamarbete.</p>
<p>Higgins (2013), systematisk översikt över metaanalyser. Äventyr i bebyggda miljöer. Vanlig skolpopulation.</p>	<p>Översikten påtalar tydliga och genomgående positiva effekter på akademisk inlärning och mer övergripande utfallsmått såsom självförtroende. Elever som deltog i äventyrsprogrammen gjorde framsteg motsvarande tre månaders skolarbete i genomsnitt.</p>
	<p>Det genomsnittliga effektmåttet var 0.23 med en variation mellan 0.17 och 0.61, d.v.s. effekterna var låga till måttliga.</p>
	<p>Högre effekt uppnåddes i program som pågick längre tid (minst en vecka) och var naturbaserade. Även andra program visade positiva resultat.</p>
<p>Gillis (2008), systematisk översikt över meta-analyser, originalstudier (44). Äventyrsprogram utan övernattnig. Vanlig skolpopulation. Några ungdomar (11–25 år) med speciella behov.</p>	<p>Det genomsnittliga effektmåttet var 0.43. Måttliga positiva effektmått fanns för self-efficacy (0.48), positiva beteenden (0.37), personlighet (0.29), självuppfattning och självuppskattning (0.26) och akademisk prestation (0.26).</p>
<p>Coalter (2010). Okänt antal studier. Vandring i skog och berg utan övernattnig. Vanlig skolpopulation, unga dömda för brott, högriskungdomar, unga med ADHD.</p>	<p>Översikten visar på positiva effekter på fysisk hälsa och fysisk aktivitet, inklusive det kardiovaskulära systemet, skelettmuskulaturen, endokrina systemet och immunförsvaret.</p>
	<p>Få studier har uppmärksammat sociala och ekonomiska effekter av program baserade på vandring i skog och berg.</p>
	<p>Översikten identifierade även negativa effekter med vandring i skog och berg, även om dessa inte var av särskilt allvarlig art (ungdomar som smutsat ned sina byxor).</p>



<p>Gill (2011), systematisk översikt, 61 originalstudier.</p>	<p>Det finns starka bevis för att barn och unga som regelbundet exponeras för natur fick större miljömedvetenhet och högre känsla för lokalsamhällets natur som vuxen. Att bo nära gröna ytor hade ett starkt positivt samband med fysisk aktivitet, mental hälsa, bättre emotionell kontroll för barn med och utan speciella diagnoser.</p>
<p>Uteundervisning i gröna miljöer</p>	<p>Barn som deltog i utomhusundervisning i gröna miljöer förbättrade sin inläring och utvecklade hälsosammare matvanor jämfört med andra barn. Erfarenhet av gröna miljöer hade ett starkt samband med högre miljömedvetenhet.</p>
	<p>Det fanns relativt starka indikationer för att skolor med grön utomhusundervisning och skolor med program för skolträdgårdar utvecklade elever med bättre sociala färdigheter jämfört med andra skolor. Vidare hade dessa skolor elever som förbättrade självkontroll, kunskap och självinsikt. Lek i naturmiljöer utvecklade förskolebarns motoriska färdigheter och kondition mer jämfört med andra barn på andra skolor utan naturmiljöer i anslutning till skolgården.</p>
<p>Davies (2013), översikt (N = 58). Kreativitet. Vanlig skolpopulation.</p>	<p>Översikten påvisar starkt stöd för att undervisning utomhus främjar elevernas kreativa förmåga, bl a i form av bättre samarbete i grupper. Det fanns relativt stark evidens för högre elevmotivation, deltagande i undervisningen, belåtenhet med undervisningen, koncentration och uppmärksamhet genom utomhusundervisning. Det framkom även evidens för att kreativa miljöer – som oftast utemiljöer innebär – främjar barns och ungas emotionella och sociala utveckling.</p>
<p>Bowen (2013), meta-analys (N = 197) Äventyrsterapi. Ingen särskild grupp.</p>	<p>Effektmått .47 för äventyrsterapi jämfört med alternativ terapi (.14) och kontrollgrupp (.08).</p>
<p>Cooley (2015), systematisk översikt, 11 originalstudier. Utomhusaktiviteter i bebyggda miljöer. Population från högskola/ universitet. Utfall kopplade till gruppsamarbeten.</p>	<p>Översikten påvisade evidens för att eleverna utvecklade färdigheter kopplade till gruppsamarbete, och att färdigheterna fanns kvar efter programmets slut. Det saknades dock stöd för att eleverna kunde använda sig av färdigheterna i olika sammanhang efter de tidsmässigt korta utbildningsprogrammen.</p>

Stott (2013), systematisk översikt, 35 originalstudier. Äventyrsexpeditioner utomlands, 14 dagar eller mer. Äldre ungdomar och yngre vuxna.	Personlig utveckling. Förbättrat självförtroende. Fysisk och social stabilitet, klara av utmaningar och överkomma svårigheter. Förbättrade sociala förmågor. Ökad självinsikt och självreflektion. Ökad miljökunskap, miljömedvetenhet och uppskattning av naturen.
Barton (2010) N = 10. Fysisk aktivitet och motion i gröna miljöer. Vuxna. Självkänsla. Humör.	Aktivitet i gröna miljöer förbättrade både självkänsla och humör, hos både män och kvinnor. Den största förbättringen när det gäller självförtroendet uppvisades hos deltagare med diagnos på psykisk sjukdom. Det genomsnittliga effektmåttet för förbättrad självkänsla var: 0.46. Humör: 0.54. Översikten fann positiva effekter genom fysisk aktivitet och motion i gröna miljöer. Effekterna minskade efter programmets slut, men det fanns positiva effekter även på lång sikt.
Fiennes m.fl. (2015), systematiska översikter (58) Inläring utomhus. Storbritannien.	Nästan alla studier redovisar en positiv effekt på skolrelaterade effektmått av utomhusundervisning. Effekterna minskar vid uppföljande utvärdering, men förbättringen i självkontroll kvarstod på lång sikt. Program som pågick en längre tid (t.ex. med övernattnings) hade större effekter än kortare program/insatser.
Becker m.fl. (2017)	Skolprogram med uteundervisning kan främja elevers fysiska, psykiska och sociala hälsa och utveckling, samt främja akademiska prestationer. Fler longitudinella studier på större elevgrupper krävs för att stärka evidensen ytterligare.
Mann m.fl. (2022), systematisk översikt över studier publicerade 2000–2020. N=117 st.	Undervisning utomhus och i naturen förbättrade elevernas engagemang i och "ägandet" av studierna och inläringen. Det fanns även vissa bevis för bättre skolprestationer, utveckling av sociala färdigheter och färdigheter som rör samarbeten, ökad självuppfattning/självkänsla. Undervisning utomhus och i naturen bör inkluderas i alla elevers undervisning och bör situationsanpassas utifrån platsens förutsättningar.



# Svenskt Friluftsliv

Johannesfredsvägen 7  
168 69 Bromma

[info@svensktfriluftsliv.se](mailto:info@svensktfriluftsliv.se)  
[svensktfriluftsliv.se](http://svensktfriluftsliv.se)