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2020 Youth Nature Awareness Study

Population survey on nature and biodiversity

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2020 Youth Nature Awareness Study

Population survey on nature and biodiversity

"Nature Awareness in Germany" is a series of studies that the Federal Ministry for the Environment and the Federal Agency for Nature Conservation publish jointly every two years ("Research and Development" project, grant number 3518850100). This English version is a product of the Federal Agency for Nature Conservation (BfN).

The conceptual design and processing was carried out by Dr Christoph Schleer (SINUS-Institut, project management), Dr habil. Fritz Reusswig (Potsdam Institute for Climate Impact Research), and Naima Wisniewski (SINUS-Institut), in collaboration with Sociotrend GmbH (support with statistical analyses) and Ipsos GmbH (survey implementation) as well as technical support from the Federal Ministry for the Environment (BMU, Rebecca Mole) and the Federal Agency for Nature Conservation (BfN, Dr Andreas Wilhelm Mues).

The Youth Nature Awareness Study is part of the national strategy for biodiversity. The strategy stands for life, nature, and diversity. It demonstrates how we must act in order to maintain biodiversity for people living today and for future generations.

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Contents

Key statements and recommendations

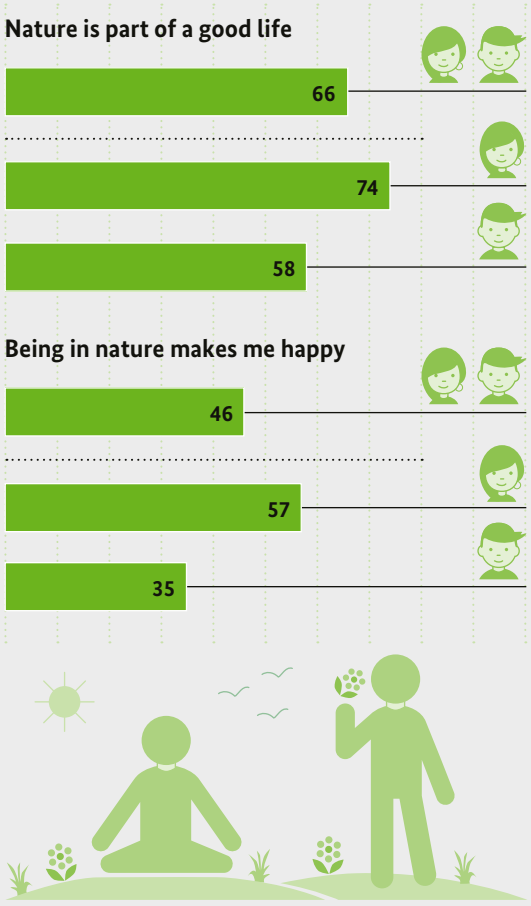
For the first time, the Federal Ministry for the Environment (BMU) and the Federal Agency for Nature Conservation (BfN) are presenting the results of a representative survey on nature awareness among young people aged between 14 and 17. To begin, the central results of the "2020 Youth Nature Awareness Study" are presented together with their key statements and recommendations for nature conservation communication and nature conservation practice. The recommendations made here fall into the current nature conservation and environment policy framework of the BMU and BfN: For more than 30 years, the Federal Ministry for the Environment has been working to protect citizens, protect the environment, and to ensure that the natural environment is handled in a way that ensures the diversity of animal and plant species and the preservation of their habitats.[1] The Federal Agency for Nature Conservation, as a scientific higher federal authority, supports the Federal Ministry for the Environment with all issues concerning nature conservation and countryside preservation as well as in international collaboration. The guiding principle[2] is a modern understanding of nature conservation, combining economical, ecological, and social aspects, with the aim of responsibly preserving biodiversity for current and future generations.

The connection between humans and nature – important for a good life

Various investigations have shown that key foundations for the connection between humans and nature are laid during childhood and adolescence. A lot depends on how we experience nature during this time and whether or not we later enjoy spending time in nature: Nature as a childhood realm of experience is a key influencing factor for the health and well-being of adolescents (Gebhard 2020, Raith and Lude 2014). Early experiences in and with nature have a significant influence on nature conservation-oriented behaviour and general appreciation of nature (Broom 2017).

In the lifeworlds of young people, however, we can also see a progressive development towards increased digitalisation and technology, which is to some extent contradictory to a nature-based development. Most young people spend a lot of time at home in front of a screen, while their own experience of nature takes a back seat. The chapter on the connection between humans and nature investigates young people's impression of nature and their relationship with it in these current times.

The connection between humans and nature – important for a good life



Data in percent

Key statements:

- For the majority of young people, nature is of great personal importance: 66 percent agree strongly that it is important for a good life (a further 26 percent "somewhat"). But only 46 percent agree strongly that it makes them happy to be in nature (a further 42 percent "somewhat"). It is worth noting that girls stress personal appreciation much more strongly than boys ("Good life": 74 versus 58 percent; "Happy in nature": 57 versus 35 percent; agree "strongly").

- Young people are very aware of the endangerment of nature and nature conservation. For example, 65 percent agree strongly that it is a human obligation to protect nature (a further 26 percent "somewhat"), and 56 percent said they were very angry that so many people are so careless when it comes to nature (a further 34 percent "somewhat"). Here too, the emotional reaction of girls is much stronger than that of boys ("Obligation": 72 versus 58 percent; "Angry": 66 versus 46 percent; agree "strongly").
- The majority of young people recognise the relationship between climate change and nature conservation: 55 percent agree strongly that nature conservation is important to combat the challenges of climate change (a further 32 percent "somewhat").
- The study also reveals a clear image of the trade-off between nature conservation and economic interests: Only a minority of young people (19 percent) prioritise economic development over nature, while a clear majority of 70 percent does not share this view.

Recommendations:

Taking into account the limited opportunities for comparison[3], the indications are that young people, like adults in the 2019 Nature Awareness Study, are also outraged by the careless treatment of nature and feel a strong appreciation of nature as a social commodity. At the same time, we see that young people also attribute less importance to economic interests compared to nature conservation. This result should encourage decision-makers to make social lifestyles and economic activities more sustainable and eco-friendly in the interest of future generations.

Unlike the adult studies, which show that socially advantaged adults have a greater nature awareness in many areas than socially disadvantaged adults, this youth study presents a more complex picture, which in turn requires a differentiation in the communication of nature conservation:

In comparison to adults, far fewer young people stated that it makes them happy to spend time in nature (agree strongly: young people, 2020: 46 percent; adults, 2019: 59 percent). Above all, young people with a higher level of education are convinced by the key concerns of nature conservation, namely the well-educated **Postmaterialists**, who are anti-consumption and humanistic, as well as the adaptive middle class of youth, the **Adaptive Pragmatists**. Often, the **Conservative Mainstream**, who strive for stability and order, are also positive representatives of nature conservation.

However, they are contrasted against young lifeworlds that exhibit a significantly smaller awareness of nature:

Young people from socio-economically disadvantaged backgrounds as well as young people with a strong hedonistic orientation require low-threshold and lifeworld-enhancing opportunities that enable their personal connection with nature to be strengthened. According to the latest research findings (see Frohn et al. 2020), socially disadvantaged groups have so far been inadequately addressed when it comes to communication about nature conservation and environmental education: The established nature conservation concepts communicated in these settings often do not conform to the subjective nature concepts in which nature represents a "place of balance" or "place of freedom". Therefore, the aim should be for nature conservation to engage more in these concepts, to find a level of communication with socially disadvantaged young people, and to communicate the benefit of contact with nature accordingly. For young people from socially disadvantaged backgrounds, this benefit can be health-based, with nature providing a retreat and source of peace, relaxation, and stress-relief, offsetting their often stressful social experiences. For young Materialistic Escapists, the focus might be better placed on more experience-based group offerings, which meet the need for "fun" and "action", at least as a starting point.

On the other hand, the less nature conservation-oriented, but better educated and more creative **lifeworlds of the Experimentalists and Expeditives** should become important target groups for future nature conservation communication: Those involved in nature conservation (such as nature conservation associations) would gain a lot if, in future, they were better able to arouse the interest of non-conformist Experimentalists in the issues of sustainability and nature conservation. Since the current social and ecological crises have been caused by the established lifestyles and economic activities of the adult world, their creative potential and out-of-the-box thinking could play a significant role in overcoming the structural problems.

However, this initially requires those involved in nature conservation to reflect on their communication method, which is often found to be scientifically distant and rarely optimistic, and to discuss the issue of a good human life and social justice more frequently and with a

more creative approach. In addition, open spaces must be created within institutionalised structures to enable creative discussion with young people in the first place.

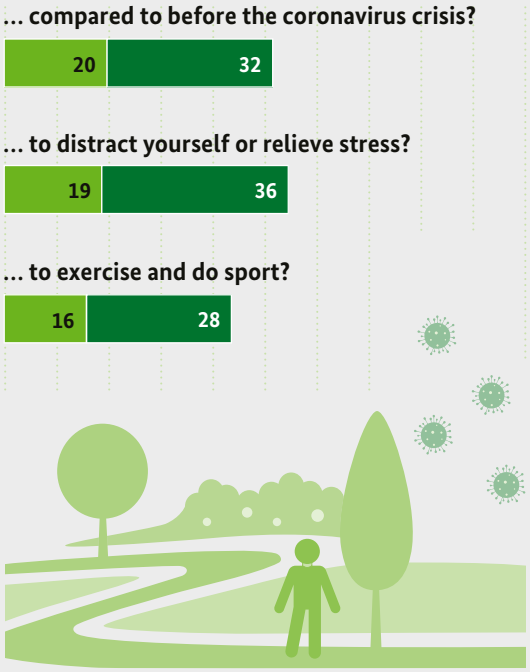
For the well-educated, innovative, and performance-driven Expeditives, it is also worth using educational offerings and career guidance to communicate more clearly that, in addition to making a contribution towards a future-proof society, a personal career path can also be developed in the context of sustainability and nature conservation.

Finally, it must be highlighted that the gender differentiation and stronger affiliation with nature of women, which has long been known from the adult studies, is reflected even more strongly in this youth study. The established nature conservation organisations in Germany should take this strong female commitment as a big opportunity by acknowledging it and using it to contribute towards improving gender equality: This can be done, for example, by creating further education courses and job entry options specifically for young women, and by opening up professions that enable them to successfully combine family life and a career. Carrying on from this, however, it is also necessary to explicitly confront the much weaker affiliation with nature of boys, such as by establishing a much stronger connection between stereotypically male interests (like a love of technology) and the guiding principles of sustainability and nature conservation, in the context of education and career guidance.

Youth and the relationship with nature during the coronavirus crisis

It's hard to think back on the year 2020 without thinking of the coronavirus. Few events in the past have had a such a significant impact on humankind, and never before has an event resulted in humankind responding to such an event on a global scale. The crisis has significantly impacted on young people's way of life. As part of the study, we looked at the influence the crisis had or is having on young people's understanding of nature and their relationship with nature.

How often were you outside in nature in the past months ...



Data in percent

Key statements:

- Fifty-two percent spent much more time (20 percent) or at least slightly more time (32 percent) outside in nature than before the coronavirus crisis. Being in nature often plays an important role in stress relief and distraction ("much more often": 19 percent, a further 36 percent said "slightly more often"), but also as a place for sport and activity ("much more often": 16 percent, a further 28 percent said "slightly more often").
- During the coronavirus crisis, nature became more important for young people. Half of young people (52 percent) stated that they consider nature to be "much more important" (18 percent) or at least "slightly more important" (34 percent).
- Thirty-six percent of young people only consider the coronavirus crisis as a health issue. About the same amount see a connection between the crisis and the condition of nature and the environment (33 percent), while almost a third were undecided (31 percent).

Recommendations:

In principle, access to nature offers fundamental opportunities everyone can enjoy. Especially in times of crisis, nature can play an important role in terms of physical and mental health – and not just for young people. We can only hope that this strengthening of the relationship with nature in times of crisis, during which young people have had many other forms of entertainment taken away from them, will be retained and will linger even when the situation returns closer to normal.

Yet we must also take into consideration that many natural environments near urban areas have suffered from "over-use" and are still subject to high levels of use that cannot be compared to the time before the crisis. Here, those responsible in the municipalities and districts must use acute and long-term intervention measures and design plans to control the levels of use of natural environments and to ensure adequate facilities with appropriately designed green spaces that meet the needs of the population. To ensure the satisfactory provision of green spaces for citizens, those involved in urban planning, nature conservation, and politics must be innovative.

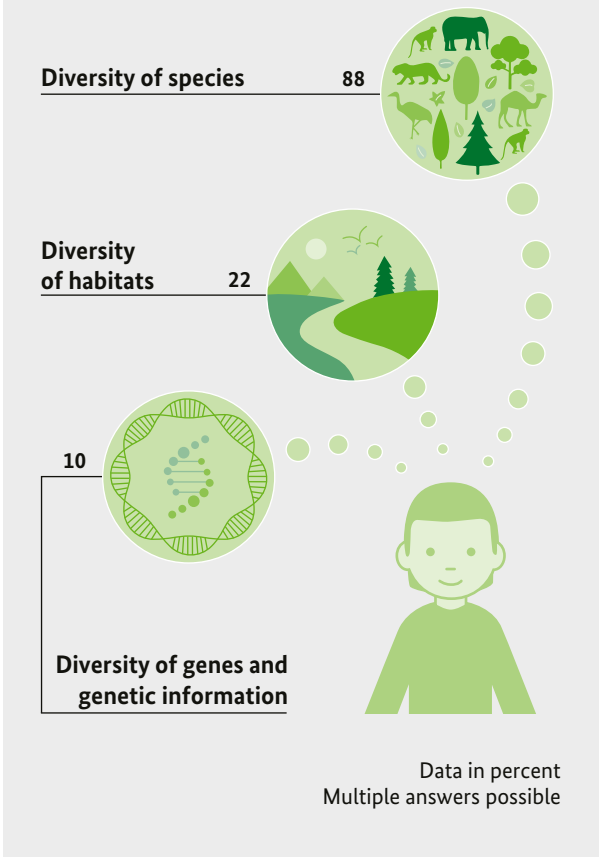
There is increasing scientific evidence of a connection between the events of the pandemic and the deterioration in the state of nature and the environment, such as through habitat loss and fragmentation. The IPBES Workshop Report on Biodiversity and Pandemics (2020) notes that pandemics, like climate change and the loss of biodiversity, have man-made causes. This includes, in particular, changing land use patterns, the expansion and intensification of agriculture as well as the trade and consumption of wild animals, and products produced from them.

Just over one in three young people also see connections between these things. In particular, however, the less well-educated young people stated particularly frequently that they see no connection and that the crisis is only a health issue ("agree strongly": 18 percent, average: 12 percent). The connection between the two issues is complex, but in future should be communicated more clearly in the focus of attention of the coronavirus crisis, to create awareness of the global cause and effect correlations of damage to the natural environment.

Biodiversity – Awareness of progressive decline

Biodiversity not only means the variety of species and habitats, but also the genetic variety within species. The current decline in biodiversity has been scientifically well-proven (see, for example, Ceballos et al. 2015; Pimm and Joppa 2015). In Germany, the National Strategy for Biodiversity (see BMU 2007) prescribes specific targets and measures to protect biodiversity. Everyone can play a part in this: The publication of the long-term study by "Krefeld Entomological Association" (see Hallmann et al. 2017) was an impressive example of how scientific communication on the loss of insect biomass was also able to attract social and media attention to the protection of biodiversity. But what is the actual significance of this issue in the lifeworlds of young people?

What does the term "biodiversity" mean to you?



Data in percent
Multiple answers possible

Key statements:

- Only just over a third (35 percent) of young people are able to explain the meaning of the term "biodiversity" in more detail. Knowledge of this increases as levels of formal education increase (low education level: 16 percent, medium education level: 28 percent, high education level: 42 percent).
- Eighty-eight percent of young people who are familiar with the term associate it with the diversity of species in the plant and/or animal world. Twenty-two percent associate it with the diversity of habitats, but only ten percent also associate it with genetic diversity.
- After having the term explained to them, almost three-quarters of young people (72 percent) were convinced that biodiversity on the earth is declining.

Recommendations:

The results show that the term biodiversity is not very well known among young people. In the most recent adult study on nature awareness, conducted in 2019, 45 percent of those surveyed said they were familiar with the term and understood what it meant, but only 35 percent of young people said the same. This finding becomes even clearer if you consider what exactly those who are familiar with the term understand by it: Among the adults in 2019, 93 percent described species diversity, 64 percent described diversity of habitats, and 42 percent described genetic diversity, while only one percent of those surveyed made other associations. Among the young people surveyed in 2020, most also understood it as species diversity (88 percent), but the diversity of habitats (22 percent) and genetic diversity (10 percent) were much less well known. In addition, 24 percent of young people who knew the term associated it with things that did not fit in any of the three facets.

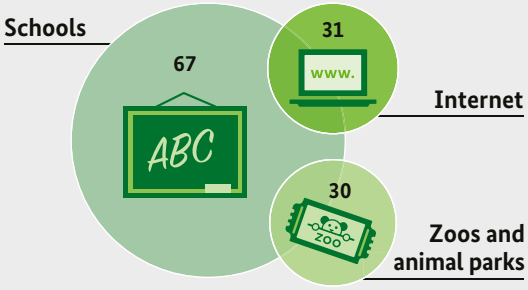
However, as soon as the meaning of the term was explained to them, it became clear that young people too are very aware of the threat to biodiversity and are also willing to act to protect it.

Given the circumstances, a fundamental transfer of knowledge in a school or non-school setting is required, with practical aspects being given priority in work with young people: The transfer of knowledge should aim to increase awareness of the problem, to increase transparency of the local and global processes involved in the decline and protection of biodiversity, and, at the same time, should be associated with the communication of specific possible actions (see the section on "Responsibility and commitment"). Further communication of so-called "transformation knowledge", which addresses young people's awareness of responsibility, should also continue (see the section on "Connection between humans and nature"), enabling everyday behaviour to be modified by shaping the future, to ensure greater compatibility with nature, environment, and climate. Improving mental skills and components, such as self-awareness and empathy, should also play a greater role – to date, corresponding positive and protective factors, which are not only relevant for nature conservation, have only rarely been addressed directly and taught intentionally in educational systems.

Species knowledge – better transfer of knowledge required in schools

Species knowledge is an important basis for the understanding and appreciation of biodiversity, and therefore also for maintaining it. We are far from knowing all of the species in the world, yet many species are already at risk of extinction. And we can only appreciate and have an in-depth understanding of those species we can actually name. Many studies indicate that species knowledge in the population, in particular among young people, is declining (see Zahner et al. 2007 and Sturm et al. 2020). Are young people interested in species diversity? Which species are of particular interest and where do young people want to acquire this knowledge?

Where, in your opinion, should more knowledge about species diversity be conveyed?



Data in percent
Multiple answers possible

Key statements:

- The vast majority of 60 percent of young people would like to know animal and plant species by name (28 percent "agree strongly", a further 32 percent "agree somewhat").
- The species groups that young people would like to know more about include, in particular: mammals (52 percent), trees (42 percent), birds (41 percent), flowering plants (39 percent), and reptiles and amphibians (34 percent).
- School was by far the place most frequently named as most important for learning about species diversity (67 percent). There is also significant interest in learning via the Internet (31 percent) or in zoos and animal parks (30 percent).

Recommendations:

Young people don't rate their species knowledge very highly, but would like to learn more about species. Sixty percent of young people expressed an interest in expanding their species knowledge, while 53 percent of adults gave the same response in the 2019 Nature Awareness Study (see BMU and BfN 2020).

From the perspective of young people, and in light of their daily experiences, the educational mandate lies with schools. Once again integrating the teaching of species knowledge in school curricula would be desirable, as this issue has only been given marginal consideration in recent years. In this connection, the following is also true: In the context of education, teachers at universities should also place greater emphasis on the subject of species knowledge, in order to counteract the decline in expertise.

Digital offerings should also be used more widely both in school and outside of school. Integrating innovative instruments like species determination apps could be a fun way to arouse interest in young people and open up the possibilities of independent further education. In addition: Even though nature tours and visits to zoos are ranked considerably below the transfer of knowledge in schools, there is nonetheless a significant share of young people who favour such non-school learning locations. Teachers could try to meet this demand by planning hikes and class trips (e.g. to a protected area), and planning lessons together with local experts, such as rangers, foresters, or representatives of the nature conservation associations. In terms of a multimodal teaching and learning opportunity, there is much in favour of developing hybrid offerings in which, for example, an app with which students learn how to identify plant and animal species is used during a nature tour.

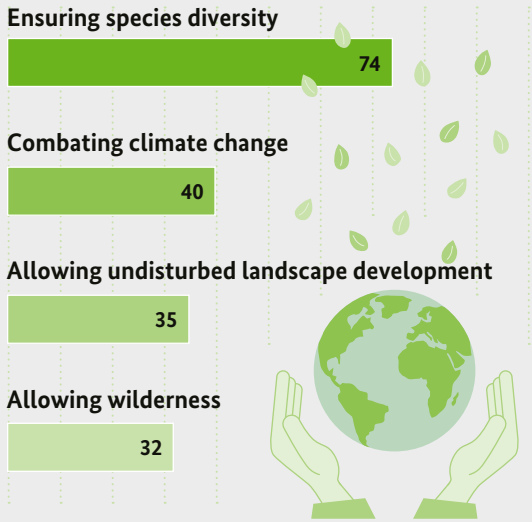
In addition, in terms of the focus of communication and educational work, it is interesting that young people tend to be interested in different species than adults: Young people are most interested in mammals, while adults rank them only in fifth place (see the 2019 Nature Awareness Study). By contrast, adults expressed a particular interest in knowledge of birds, which was ranked second by young people, almost on a par with trees.

Protected areas – indispensable for species diversity and climate protection

Protected areas are of great importance in nature conservation, nationally and internationally. In future, they are to be expanded even further in Europe under the EU Biodiversity Strategy 2030.

What do young people know about protected areas? What is their need for information? Do they play a role in the everyday life of young people?

What, in your opinion, are the most important objectives and tasks of protected areas?



Data in percent
Multiple answers possible

Key statements:

- Almost three-quarters of young people (74 percent) consider the most important task of protected areas to be protecting the diversity of plant and animal species. "Counteracting climate change" (40 percent), "allowing undisturbed landscape development" (35 percent), and "allowing wilderness" (32 percent) were also named.
- Young people would like to obtain information about protected areas via websites (64 percent) and in general educational settings, such as schools (61 percent). A good 51 percent also prefer digital media, such as apps and QR codes.
- For young people, the three most interesting topics of information about protected areas are "protected plant and animal species" (72 percent), "protected habitats" (44 percent), and "the state of the protected areas" (34 percent). Twenty-one percent would like information on ways that they themselves can get involved in protected areas (multiple selections possible).

Recommendations:

As in the adult survey in 2019, it is clear that young people also consider the most important task of protected areas to be protecting animals and plants. Given that it is considered so important, the protective function can be used as a good starting point for communicating further information about protected areas. Young people are less aware of other important roles in the context of human lifestyles and economic activities: For example, only nine percent named the recreational function of protected areas. Therefore, one objective should be to increase efforts to communicate the variety of roles and objectives of protected areas. Young people should be taught that protected areas are places in which people can develop a successful coexistence with nature.

The preference for digital communication and knowledge transfer in the context of "Protected areas" shows clearly that young people prefer websites over other information sources. This finding confirms the clear trend towards digitalised nature conservation communication and highlights its importance.

However, it is also striking that young people consider traditional educational institutions, such as schools, to be important in providing information about protected areas. It must be assumed that young people are basing this on their daily lifeworld, which is why educational programmes should be further expanded in cooperation with corresponding educational institutions.

Responsibility for and commitment to nature – achieving something together

Current youth movements, such as "Fridays for Future", show that the young generation is demonstrating and demanding an increasing level of responsibility for and commitment to the protection of our planet. For some years now, young people have seemed less politically disenchanted with regard to nature conservation and environmental protection. Studies show that young people are becoming increasingly interested in politics (see Albert et al. 2019). This study investigated who young people hold accountable for nature conservation and just how willing they are to get personally involved. How effective do they consider their generation to be at a collective and personal level, and how much responsibility are they themselves willing to accept?

Responsibility for and commitment to nature – achieving something together

Key statements:

- In response to the question on responsibility for nature conservation, young people attribute this obligation "completely" to politics (61 percent). However, young people also attribute significant responsibility to nature and environmental protection organisations (56 percent), the agriculture and forestry sector (49 percent), citizens themselves (49 percent) as well as industry, trade and other business (45 percent). Almost without exception, less well-educated young people assign these responsibilities a lower priority (e.g. politics, low education level: 42 percent, high education level: 66 percent).

- Young people consider collective effectiveness to be significantly greater than their personal effectiveness. They are convinced that humankind as a whole can achieve something to protect the Earth (59 percent "agree strongly", a further 25 percent "agree somewhat"). The conviction that they are able to achieve something personally is less pronounced (22 percent "agree strongly", a further 31 percent "agree somewhat").

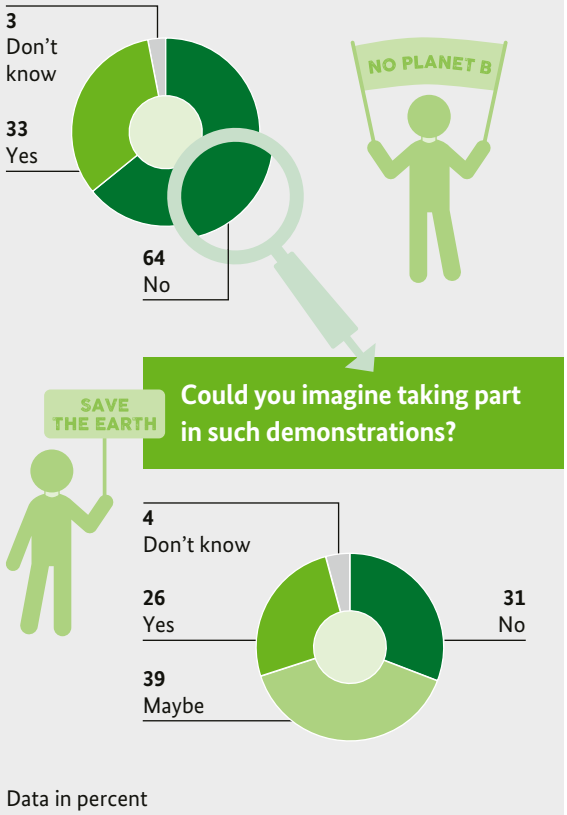
- A third of young people have already taken part in at least one demonstration on the subject of nature and environmental protection (e.g. "Fridays for Future"). Of those who have not yet taken part, 26 percent could envisage doing so in future, and a further 39 percent responded "maybe".

- Over half of young people expressed a willingness to change their personal behaviour. For example, 49 percent are completely willing to stop using single-use products (a further 35 percent "agree somewhat"), and 30 percent would limit their consumption of meat or avoid it completely (a further 25 percent "agree somewhat").

Recommendations:

A responsible and committed generation is growing up today, making its voice heard with calls for change through youth movements. Politics should be receptive to young people's need for active involvement and respond with specific ways in which they can get involved. At the same time, it is worth noting how realistic young people are. They attribute much greater importance to collective effectiveness than their own personal effectiveness. Their willingness to take part in demonstrations for nature conservation and environmental protection highlights opportunities for targeted communication strategies, which can focus both on reinforcing nature conservation behaviour and on democratic opinion-forming processes. Such efforts can result in desirable direct and indirect feedback on current nature and environmental protection policies.

Have you taken part yourself in demonstrations for nature and environmental protection, for example Fridays for Future, Ende Gelände, or others?



Data in percent

The potential willingness of young people to get involved in nature and environmental protection represents a good basis for promoting their actual involvement: They can be accessed specifically through targeted communication of nature conservation in schools and at extracurricular learning centres as well as via social media. Regular information and projects on specific issues, such as species protection, zero waste, waste avoidance, food waste, microplastics, and sustainable consumption, can be integrated in these traditional as well as modern and virtual learning environments to highlight the possibilities of making a personal contribution towards protecting nature and the environment. Young people in particular, whose range of experience is more limited than that of adults,

need easily understandable pointers towards very specific personal actions they can take.

In some groups, commitment is lower: The less one's personal environment has to do with nature conservation, the less likely it is that one will be involved with the issue in future. In order to also arouse the interest of these groups of young people, it would make sense for committed young people to hold workshops at schools or to report on personal involvement options and thereby provide an opportunity for identification. This is one way to motivate under-represented target groups, such as those with low levels of education or consumption-oriented milieus, to get personally involved.

Ultimately, the data also shows the importance of communicating the collective shaping power: Addressing the current ecological crisis as a task for "us" significantly increases the chances of a collective response to resolve the crisis.

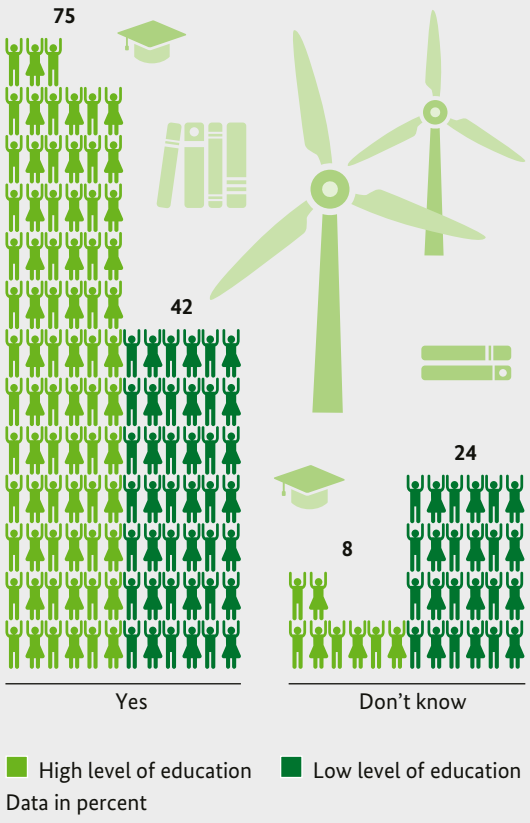
Energy transition – a generational project

Since 2011, studies of nature awareness among adults have shown that acceptance of the energy transition is consistently high in the population, at around 60 percent. Where do young people stand with regard to this issue? One burning question is whether young people have a more positive attitude towards the energy transition than adults, having grown up in a time in which it is communicated as an obvious political goal. Since 2011, following the nuclear accident in Fukushima and the nuclear phase-out decision in Germany, the subject of the energy transition has become a fixed component of political discussion. The subject of climate change is also becoming an increasingly prominent aspect of international and national political and social debate and, in particular in Germany, the aim of phasing out fossil fuels has become a focus. Accordingly, the focus of youth movements for nature conservation and environmental protection has also changed. Aside from demonstrations, though, what do young people think about the energy transition?

Key statements:

- The majority of young people are in favour of the energy transition: 66 percent agree with it, 21 percent are undecided and only two percent disagree with it. However, eleven percent did not feel able to give any opinion at all.
- Education significantly influences opinions on the energy transition. Among young people with a higher level of formal education, three-quarters agree with the energy transition, while only 42 percent of less well-educated young people agree with it. The share of less well-educated young people who were unable to give any opinion on the energy transition was also three times higher than the share of well-educated young people (24 percent versus 8 percent).

Do you think the energy transition towards predominantly renewable energies is the right way to go?



Recommendations:

On the whole, as in the studies of nature awareness in adults, this confirms that most young people are no longer asking "why?" when it comes to the energy transition, but "how?". In fact, more young people were in favour of the energy transition than adults in 2019 (66 versus 60 percent).

However, it is also worth noting that their approval is heavily linked to their level of education. A lower level of formal education does not primarily translate into a rejection of the energy transition, however, but rather a higher degree of uncertainty or disinterest. So, for example, better information must be provided in schools regarding the importance of the energy transition, so that young people from all educational backgrounds can form an opinion on it as part of a "generational project". This includes detailed discussion of possible implementation measures and their advantages and disadvantages. In this regard, it is also important to reflect on implementing the energy transition in keeping with nature conservation objectives.

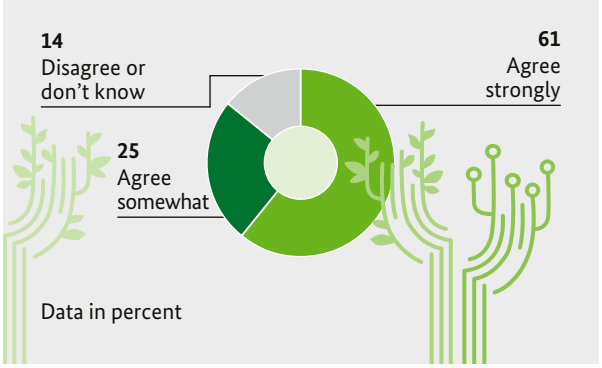
Disinterest can potentially be counteracted by providing communication on the energy transition in the context of climate change, which has already seen high levels of activation in youth movements and arouses great interest in young people. The subject of the energy transition also offers the possibility of shifting the focus of communication to the opportunities, such as to show that the conversion of new energy systems is not only associated with dismantling old structures, but also with creating new, technically advanced jobs.

Agro-genetic engineering and new genetic engineering processes in nature conservation – scepticism predominates

Due to current technical breakthroughs, the social debate on genetic engineering is once again gaining importance: For example, new genetic engineering methods, such as genome editing, enable targeted editing of genes, and many new applications for genetically engineered plants and animals are being researched. The precision of genetic engineering is growing to the extent that increasingly precise modification of the genetic makeup itself is possible. However, now as before, it is difficult to predict whether the intended properties (such as adapting a plant to drought) can actually be achieved and whether unintentional effects on human health and the environment can be ruled out. Genetic engineering, or deliberately changing the genetic makeup of organisms, is a fast-growing research area and an important economic factor, the development of which is closely linked with significant controversies. Young people in particular are confronted with ambivalent messages in this area: On the one hand, there are warnings against genetically engineered organisms and a demand for extensive risk assessment, while on the other hand, the comparatively recent development of "genetic scissors" was awarded a Nobel Prize in 2020.

Previous studies on nature awareness among the adult population show that scepticism regarding genetically engineered organisms in nature often predominates. What are the opinions of young people?

When plants are specifically genetically engineered, the potential effects on nature should always be explored.



Key statements:

- Most young people are sceptical about genetic engineering in nature: Around three-quarters (74 percent) of young people oppose "messing around with nature". Seventy-one percent think that people should not "play God".
- Eighty-six percent of young people agree that potential effects of genetic engineering on nature should always be investigated, and of these 61 percent were emphatic ("agree strongly").
- Young people also had reservations regarding genetically modified food: Only 36 percent reported that they would have no problem consuming genetically modified food ("no problem": nine percent; "somewhat insignificant problem": 27 percent). Eighty-three percent would also like clear labelling of food products from animals that had been fed with genetically modified feed.

Recommendations:

The results of the study show that many people have concerns about the use of genetic engineering in agriculture and nature. It is interesting to note that the representative 14 to 17-year-olds surveyed in this study take a slightly less clear stance against genetic engineering than adults. For example, in 2019, 55 percent

of adults "agreed strongly" that people have no right to genetically engineer plants and animals (a further 29 percent "agreed somewhat"), while only 32 percent of young people in 2020 "agreed strongly" (a further 33 percent "agreed somewhat"). Another example: Among the adults, 80 percent agreed strongly that the potential impacts of genetically engineered plants on nature should always be explored (a further 15 percent "agreed somewhat"), while only 61 percent of young people gave the same answer (a further 25 percent "agreed somewhat"). These findings are also worth noting because, for this and other questions in the adult study from 2019, there were no significant deviations from the rest of the population, even for the youngest group surveyed, the 18 to 29-year-olds. Overall, however, the trend towards opposing genetic engineering methods increases as age increases.

Yet even among 14 to 17-year-olds, scepticism predominates overall. For young people too, transparency and freedom of choice, as well as precautions and research into risk, are and remain key terms in the context of genetic engineering. As far as young people are concerned, transparency and freedom of choice must prevail in terms of the consumption of genetically modified food products. The vast majority of young people would like a labelling requirement even for animal products produced from livestock fed with genetically modified feed.

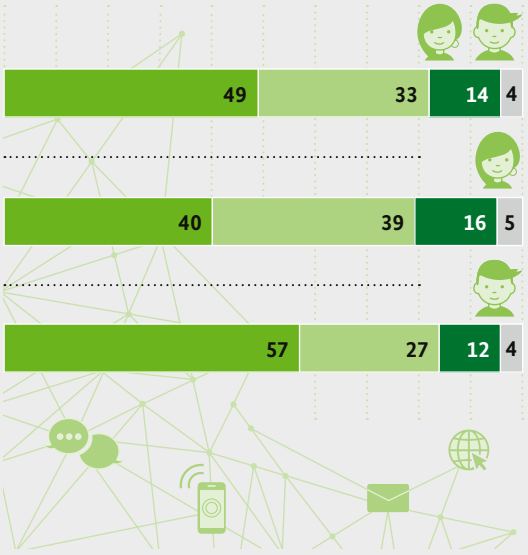
The majority of young people require the potential consequences of genetic engineering on humankind and nature to be adequately explored and thereby highlight the particular importance of research into risks and the precautionary principle in accordance with the existing legal situation.

Promoting debate among and with young people is crucial so that they can consolidate their independent opinion and actively contribute to the social decision-making process.

Digitalisation in nature conservation – the differentiated attitude of digital natives

The 14 to 17-year-olds surveyed as part of this study are already digital natives. This means that, for them, life without streaming, social media, and online shopping is unimaginable. While many older people have doubts about digitalisation and concerns about data security, for example, young people appear to be more carefree. But is this really true? The opportunities and risks of digitalisation must be explored in the different lifestyle and economic sectors, and good, secure handling of them must be established. Digitalisation is advancing in nature conservation too. For example, there are apps that aim to bring people and nature closer by digital means. The study asks how exactly young people feel about the subject of digitalisation in nature conservation.

There is currently a lot of discussion about digitalisation. Some emphasise the opportunities, others the risks. How do you personally feel about it? Do you think that digitalisation provides more opportunities or poses more risks?



Key statements:

- Young people have a differentiated and rather positive opinion of digitalisation: Almost half (49 percent) of young people see opportunities or significant opportunities in digitalisation, 14 percent see risks or significant risks, and 33 percent were undecided. The positive assessment of the opportunities is significantly stronger among boys than girls (57 versus 40 percent).
- Young people view digitalisation in nature conservation with great ambivalence. They rate the opportunities (31 percent) and risks (27 percent) almost on a par, while a further good third of

young people sit somewhere in the middle. Here too, boys see more opportunities than girls (36 versus 24 percent).

› However, 71 percent of young people are of the opinion that nature conservation should try to make better use of the opportunities of digitalisation (33 percent "agree strongly", 38 percent "agree somewhat").

Recommendations:

Compared with the results of the adult study on the subject of digitalisation, young people appear to be more convinced of the basic opportunities of digitalisation than adults (49 versus 32 percent). At first glance, they appear slightly more reserved than adults as far as the opportunities of digitalisation in nature conservation are concerned (31 versus 37 percent of adults). However, this changes if the question is posed such that it concerns active development and use of the opportunities of digitalisation for nature conservation: In this case, 71 percent of young people now agree strongly or agree somewhat, while in 2019 only 57 percent of adults agreed. These results clearly show that, according to young people, digitalisation should, in principle, be used more in all areas of life. Nature conservation should actively endeavour to tap positive potential for itself. In terms of nature conservation communication, it is about winning over the young digital natives in order to make nature conservation work future-proof in the transition between generations.

But how exactly should digitalised communication of nature conservation with young people take shape? Some young people don't have particularly strong links with nature, but are very savvy when it comes to digital media. Digital offerings of nature discovery, environmental education, and education in sustainable development can build bridges here. Targeted communication can take the form of websites, computer games, or apps that are age-appropriate, free, and easily accessible. In the field of digital media in particular, formats can be drawn on that are already being used by young people.

An important aim of nature and environmental education should be educational work relating to the benefits as well as the costs of digitalisation, and communicating factual knowledge: Probably only a small number of young people are aware that the popular consumption of streaming services increases power consumption, for example, and produces vast quantities of harmful greenhouse gases.[4] In the young user groups, another key problem is the vast consumption of resources by devices like smartphones, which are also subject to a fast product cycle and replacement with newer and more modern devices.

Overall assessment

There has been and still is a lot of discussion on the relationship between young people and nature/nature conservation. To put it in somewhat exaggerated terms, there are two opposing ideal-typical positions: On the one hand, it is claimed that children and young people are increasingly alienating themselves from nature due to the influence of consumption and media use, with a variety of empirical (usually quantitative) evidence being quoted, such as the decline in species knowledge or the length of time spent outdoors. On the other hand, there are also many studies (often qualitative) that only report a change in the connection with nature in this age group, but not a qualitative deterioration or alienation.

The results of the 2020 Youth Nature Awareness Study show that neither of these generalised positions actually adequately describes young people. Instead, the study draws a very differentiated picture of a generation that is familiar with both: on the one hand, the stimuli of an increasingly extensive communication and media world, including not least of all the pressure to be successful in everyday school or educational life, that in part alienates them from nature. On the other hand, however, it is clear that young people's own access to nature and concerns about nature conservation, which can be served both by new media as well as political protests, are shaped by their respective experiences and lifeworlds.

It is important for all generations to work together on future-oriented, innovative, and viable solution strategies for nature conservation, climate protection, and sustainable development. Current decision-makers must therefore be genuinely willing to meet young people as bona fide equals, involve them in participation processes, and not undermine the debate through contrived formats or patronising communication. Tolerance for new and unusual solutions is an absolute requirement to ensure that the creative potential of a committed and young generation can fully unfold.

1 Introduction

On behalf of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Federal Agency for Nature Conservation (BfN), detailed information on the nature awareness of the German-speaking adult population has been being collected every two years since 2009 and published as a nature awareness study. In the current study, a separate survey of nature awareness among young people was carried out for the first time. This is intended to take into account the increasing interest of young people in issues regarding nature and the environment. The results of both the last Shell Youth Study (see Albert et al. 2019) and the SINUS Youth Study 2020 (see Calmbach et al. 2020) show that climate change, nature conservation, and environmental protection are among the top issues for the young generation.

This brochure primarily presents the results of a representative survey, which was implemented in early summer 2020 with 1,003 young people aged between 14 and 17. The data was collected using a mixed method design, which essentially involved an online survey (n = 902) and additional face-to-face interviews (n = 101), in order to also survey young people who are hard to reach online.[5]

The conceptual design of this study was completed prior to the beginning of the coronavirus crisis. Therefore, most chapters of this publication are based on the above-mentioned representative survey, which did not include any specific questions about the coronavirus. However, since a youth study published in 2021 without any information on the coronavirus crisis would be unthinkable, an additional survey was implemented in November 2020 dealing exclusively with the subject of the coronavirus. Unlike the main survey, this additional survey was aimed not only at young people aged between 14 and 17, but also young adults aged between 18 and 24 years. A total of 1,000 additional young people and young adults were surveyed.

The conceptual design and reporting were carried out by Dr Christoph Schleer and Naima Wisniewski from SINUS Markt- und Sozialforschung GmbH, Dr habil. Fritz Reusswig from the Potsdam Institute for Climate Impact Research (PIK), and with the technical support of BMU and BfN. The data was collected in summer 2020 by Ipsos GmbH. During development of the questionnaire, the project team was supported by an expert advisory group that included: Dr Uta Eser (Büro für Umweltethik, Tübingen), Prof. Dr Ulrich Gebhard (University of Hamburg), and Prof. Dr Armin Lude (Ludwigsburg University of Education).

A scientific final report with in-depth analysis of the study results is planned for 2021. Following completion of the research project, the data record with all survey results of the scientific research community will be provided via the social sciences data archive at the GESIS-Leibniz Institute.

This brochure as well as the brochures for all nature awareness studies, including the respective scientific consolidation reports, can be downloaded from the BfN website (www.bfn.de/naturbewusstsein.html).

1.1 Objectives and concept

This study relates to a representative survey of nature awareness among young people in Germany aged between 14 and 17. The objective of the study is to gain key information about young people's knowledge, attitudes, and willingness to take action in the context of nature, nature conservation, and biodiversity. The findings will be made available to interested members of the public, research bodies, as well as national nature conservation players in politics and practice. In terms of content, the study is based on the previous nature awareness surveys carried out among the adult population. The main questions cover:

The connection between humans and nature

What is nature for young people? When they think of nature, what spontaneously comes to mind? What is the personal significance of nature for young people? What is their opinion on the endangerment of nature? Where do they situate nature conservation in the conflict between politics and economics?

The relationship with nature during the coronavirus crisis

What influence has the coronavirus crisis had on the connection between young people and nature? Do they rate nature more highly now? Do young people see a connection between the pandemic and the endangerment of nature and the environment?

Biodiversity

Are young people familiar with the term biodiversity? What do they understand by it? And: Are they aware of the decline in biodiversity?

Species knowledge

How do young people rate their own species knowledge? How interested are they in species knowledge? In their opinion, which learning facilities would be suitable for communicating more knowledge of species diversity?

Protected areas

What do young people understand by protected areas and which protected area categories are they familiar with? How often do young people purposefully visit protected areas? In their opinion, what tasks should protected areas fulfil and to what extent are they interested in finding out more about protected areas?

Responsibility for and commitment to nature

How important do young people consider commitment to nature conservation to be? Who do they consider to be primarily responsible? How do young people rate their own effectiveness as a generation and as individuals? What types of public and private commitment do they think are important and to what extent would they themselves be willing to do something about protecting nature?

Renewable energies

What do young people think about renewable energies? Do they agree with the energy transition towards an energy supply from predominantly renewable energies, or are they critical of and opposed to this?

Agri-genetic engineering

What basic attitudes do young people have towards genetic engineering and how do they respond to arguments for and against the use of genetic engineering in agriculture?

Digitalisation

How do young people assess the opportunities and risks of digitalisation in general and digitalisation in nature conservation? What are their attitudes towards using the opportunities of digitalisation in nature conservation?

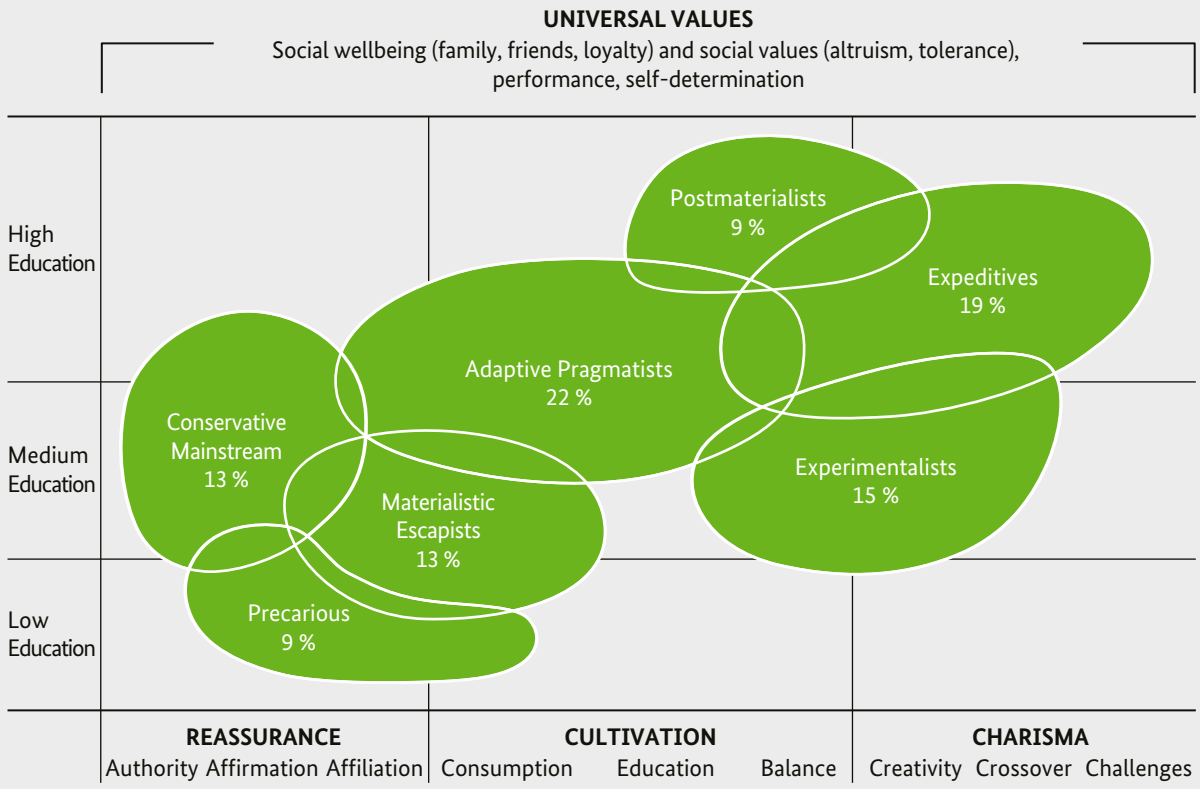
1.2 Introduction to the SINUS milieus

Socio-demographic characteristics such as age, education, and gender are not enough on their own to explain individual attitudes, behaviour patterns, and ways of accessing nature. How young people experience, use, and value nature is at least equally dependent on their lifestyles and value orientations. That's why the SINUS model of young people's lifeworlds was integrated in the research design of this study. The differentiated analysis of the data according to young people's lifeworlds supplements the socio-demographic analysis with lifestyle and value components.

The SINUS model of young people's lifeworlds groups together young people who are in terms of values, basic attitude to life, and lifestyle, as well as those in a similar social position. In contrast to traditional stratification and lifestyle models, the classification here is socio-cultural: As well as value attitudes, the different facets of daily life (such as leisure, family, school, friendship groups, media use, career orientation) are taken into account in order to provide as comprehensive an image as possible of young people's focuses and lifestyles. The SINUS model of young people's lifeworlds is not based on partial aspects of everyday reality, but focuses on young people and the overall frame of reference of their lifeworlds as a whole.[6] These could also be referred to as social milieus. However, since young people's socio-cultural core identity is not yet fully developed and shaped, the term lifeworlds is more appropriate. These are real groups of people with shared contexts and communication contexts in everyday life. The young people within a lifeworld share similar, behaviour-influencing concepts and have similar ideas of values, quality of life, and lifestyle.

By including the SINUS lifeworlds indicators[7] in the questionnaire design of the study, quantitative mapping of the members of the different lifeworlds in the youth population is possible. Figure 1 shows the model of SINUS lifeworlds for young people aged 14 to 17 in Germany. It is made up of seven different lifeworlds, which are positioned in a two-dimensional axis system. The vertical axis indicates the level of education while the horizontal axis represents the normative basic orientation. The higher the position of the lifeworld in

Figure 1: SINUS model for youth lifeworlds in Germany 2020



this graphic, the higher the level of education; the further right it is positioned, the more modern the values are from a socio-cultural perspective.

The values axis maps both the values shared by all young people and the lifeworld-specific values range. The values considered by all young people as being fundamentally desirable include in particular: a harmonious family life, reliable and good friendships, and loyalty from a partner. Young people also highlight the importance of social values, especially altruism and tolerance, as well as achievement and self-determination. In the SINUS lifeworlds graphic, these values therefore extend across all lifeworlds. In addition to these universal anchor values, however, there are also values that are lifeworld-specific. These can be classified and described based on three central, normative basic orientations:

- The "Security" basic orientation maps a set of values that combine alignment with authorities, affirmation of the existing social order, and the desire for social connection. The desire to stay grounded in reality and put down (local) roots is dominant. Getting settled is more important than breaking away.

- While the "Security" area tends to be lower middle class and traditional, the values of the "Recognition and Benefits" basic orientation range from materialistic to post-materialistic values, depending on the educational background. Depending on social position, the people in this group seek confirmation through the possession of classic status symbols (materialistic claims of superiority), the capacity for adaptive navigation (claims of superiority through strong willingness to adapt), or through a postmaterialist habit (cultural-intellectual claims of superiority). In principle, this basic orientation is characterised by the desire to achieve a good balance between maximising opportunities for prosperity on the one hand, and pursuing leisure and consumer interests as well as maintaining social relationships on the other hand. For young people who aspire at least to an intermediate school-leaving certificate, educational values are significantly more important than for young people who are aiming for a lower school qualification.

- The "Charisma" basic orientation is characterised by values and virtues that reflect the desire to look for new horizons (be it mentally, aesthetically, socially, culturally, or geographically), find exciting challenges, question the status quo, try out alternatives, and also take risks. Highlighting creative difference by deliberately crossing the frontiers of style to distance oneself from the "grey mainstream" is typical here. In this individualistic basic orientation, a charismatic interior

and exterior play an important role. But it's not just about exuding a particular charisma, but also "capitalising" on it. Creativity, performing, and networking are key values of this basic orientation.

Yet these normative basic orientations should not be understood as completely separate or divisive categories. The value attitudes of young people today follow less of an "either/or" logic than an "as well as" logic. Despite the great importance attributed to post-modern values, young people with a dominant "Charisma" basic orientation also follow some of the traditional values of the "Security" basic orientation, for example, but to a lesser extent than all other young people.

The profiles of the young people's lifeworlds are presented below.

Conservative Mainstream

The value profile of these young people is characterised by the need for stability, order, and balance. A strong awareness of the proven social order and the wish to adhere to this is characteristic. A modern middle-class lifestyle is also typical, characterised by the desire for social proximity and warmth as well as a balance between work and leisure, personal interests, and family obligations.

The Conservative Mainstream milieu describes itself as unremarkable and reserved, familial, sociable, quiet, and grounded. While these attributes are discredited by many other young people as boring, the Conservative Mainstream consider them to be positive characteristics. Their motto is: "Better to err on the side of caution." This desire for security is also reflected in how they organise their daily life: The Conservative Mainstream shy away from change and stick to habits and certainties. A controlling mentality is typical. They tend to be sceptical of new things and take a wait-and-see approach. They are strongly focused on familiar structures and environments.

For the Conservative Mainstream, self-discipline is more important than self-expression. Accordingly, lifestyle ambitions and consumer trends are at their weakest in this lifeworld. Here, young people are economical and controlled with their money. They don't want to "pour it down the drain".

The Conservative Mainstream take a primarily community-oriented approach to their leisure time. Many young people in this lifeworld take on volunteer work or at least sympathise with it. Direct experiences of nature (such as camping with a camp fire, bicycle tours in the countryside) are popular, with particularly positive mention of moments that create community (whether with family or friends). Nature is a symbol for home, peace, and harmony, and, for Christian believers, is also a part of God's creation.

Adaptive Pragmatists

Adaptive Pragmatists combine the middle-class basic values and virtues of harmony, family, honesty, respect, trust, punctuality, diligence, willingness to work, and determination with (post-)modern and hedonistic values such as personal fulfilment and flexibility as well as the desire for fun and an intensive life.

Young people from this lifeworld perceive that the future will demand a high level of flexibility and self-management. They don't complain about it, but accept it. They name their strengths as adaptiveness and willingness to compromise as well as realism. They take a rather sceptical stance on ideologies. They are not focused on utopia but on the achievable. They do not have plans for making a "better world", but try to find their place in the middle of society. They are rational, grounded, and benefit-oriented instead of risk-oriented. In life, they consider it important to make forward-looking and meaningful decisions. They set themselves achievable goals and are guided by reason and calculating benefits.

Adaptive Pragmatists affirm social order. They consider themselves to be responsible citizens who will pay their taxes on time in future and not be a burden to the state. If ever they do break away from their routines and "do something wild", they don't exaggerate it. However, they are fundamentally open to new things, in particular in relation to media and technologies. They adapt upcoming trends – even though they aren't really trendsetters (like the Expeditives). Intensive media consumption and high levels of activity in social networks are widespread.

They often spend their free time doing hobbies, especially the girls: playing piano, singing, horse-riding, dancing. However, these leisure occupations usually take second place behind school work. Their consumer interest is pronounced, but is usually subject to rational control.

Precarious young people

The French word "précaire" means "precarious," "uncertain," and "revocable" – key terms which can be used to describe the attitude towards life and the living con-

ditions of these young people. Their biography reveals initial fractures early on (e.g. incomplete, problematic family relationships, mental illness, expulsion from school). The everyday life of the Precarious is characterised by the battle for normality and keeping pace, and often by experiences of failure.

There are many indications that most of these young people will always move in the Precarious lifeworld because they face a number of different interwoven risks (uneducated parental home; parental unemployment; family income on or below the poverty line; poor prospects of achieving a school-leaving qualification; problematic peer group). For some, however, it could also be the case that this is just a crisis-ridden interim phase, in particular if there is a firm intention "to do everything they can to get out of there".

Precarious young people have the most difficult starting conditions. Many are aware of their social disadvantage and try to improve their situation, not allow themselves to become discouraged, and not resign themselves to it. But this lifeworld is dominated by a sense that opportunities are structurally inaccessible – or even that they are rendered inaccessible by the young people themselves (such as through taking drugs, criminality, poor performance at school) – and by the resulting fear that there will be few opportunities for participation.

Precarious young people have a strong desire to belong and to "achieve something really good as well," but perceive that they will rarely succeed at this in everyday life. Justice and fairness in society are seen as unlikely. Many experience difficulties finding their way in life, resulting in some of them withdrawing (further).

Precarious young people oscillate between withdrawal and delinquency in their leisure time. There are some who "go to school, come home, then sleep" and some who "go out straight away or even go out straight from school." The latter frequently report experiences of drugs (or dealing drugs), violent disputes, and petty criminal offences. At times they spend their free time at the boundaries of legality or even cross the line.

Materialistic Escapists

Among the Materialistic Escapists, girls and boys alike highly value status and prestige. Their handling of money is often uncontrolled and guided by a spontaneous pleasure principle. Short-term consumption goals are very important – the latest clothing and shoes as well as costume jewellery are extremely important to them. They consider making an impression with outward appearances as a strength. Traditional status symbols and luxury items (big house, fast cars, expensive clothes) are a very important aim in life.

Materialistic Escapists feel at home on big shopping streets, because that's where "their" shops are. They find it extremely important to get hold of special luxury goods items when they can. They know where you can find bargains: end-of-line stores, outlets, etc. Expensive brands help to prevent them from getting lost in the mainstream, and instead to set themselves apart from it.

They have a low affinity with education in terms of school learning; they are happy when they're "out of there" and can quickly stand on their own two feet. Many aim to make up for their educational deficits through diligence at work in the future. In principle, however, the actions of Materialistic Escapists are primarily self-centred and focused on the present. They know that they have to face up to the future, but often put it off.

While family provides a sense of security and safety, their friendship group represents fun and action. Going out with friends and "hanging out" is a fixed part of daily life. Next to going out, Materialistic Escapists consider shopping, money, and holidays to be the "coolest things in the world". They want to have fun and a "chilled life".

Experimentalists

Experimentalists want to enjoy life to the full and delay the seriousness of life for as long as possible. They live primarily in the here and now, and don't like it at all when life is made up of nothing but regulations. They have a strong desire for unhindered self-expression. Self-discipline and self-control are often difficult for Experimentalists. These young people want to cross boundaries, are willing to break the rules, "chance it," and jump in at the deep end – that's the only way to really live and learn. The fact that these young people are sometimes considered to be "rebellious" shows them that they are on the right track. Experimentalists often describe themselves as wilful, individual, and stubborn.

They are characterised by a very low focus on routine. They emphasise how boring they find it when things constantly repeat themselves, people always want to play it safe, stick to what they know, and are against change.

In the comparison of young people's lifeworlds, Experimentalists have the least affinity with traditional middle-class values such as groundedness, conscien-

tiousness, obedience, discipline, sense of duty, order, and cleanliness. Of all of the lifeworlds, the Experimentalists most clearly express the desire to "live differently". The subcultural, the underground, the esoteric impress and attract them. They find excitement in people who are different, who have something fascinating about them because they reject conventions. But they are bored by the bourgeois, normal, career-driven, and conventional. They want to set themselves apart, stand out from the crowd, and keep changing.

For these young people, leisure primarily means creative personal fulfilment. Learning new skateboard tricks, playing in a band, sewing their own clothes, dancing, photography, drawing, and painting (e.g. as part of a Manga or graffiti scene).

Postmaterialists

Postmaterialist young people can clearly formulate the extremely humanistic catalogue of values they find relevant. Democracy, freedom, pacifism, tolerance, justice, equality, and care for people, animals, and the environment are maxims according to which they wish to live their lives. Some also have a comparatively strong sense of mission – they find it important to convince others of their opinions. They combine these virtues with values of self-expression and commitment.

They distance themselves from ostentatious luxury and material excess, but don't reject material values per se. They like "nice things" and want to enjoy life. Yet Postmaterialists are more cautious in this regard than young people from other lifeworlds. Sustainability is not an empty formula for them, but a credible guideline in life. They are focused on the common good, believe that everyone is equal, and want this to have meaning not only on paper, but in reality too.

Intellectuality, education, and literacy are of relatively high importance for Postmaterialists. At the same time, they come across as cool and relaxed. They don't really give off the impression that they are bothered by pressure to perform. They look on challenges as the "spice of life" – happy to face them and generally well-equipped to handle them. This is primarily due to the fact that Postmaterialists are very well-educated young people. They enjoy expanding their knowledge, their own horizons, and their personal skills, and find this important.

Postmaterialists seek out a variety of intellectual, artistic, or creative experiences in their free time. They like dealing with social and political issues. They are mainly interested in nature, environmental and sustainability issues, and (especially girls) gender and sexuality issues. They like to discuss these subjects a lot in their friendship groups.

Expeditives

A colourful patchwork of values is typical of Expeditives. They highly value a balance between personal fulfilment, self-expression, independence, and creativity on the one hand, and performance ideals, such as career aspirations and success, ambition, and diligence on the other hand. Of all young people, they are the most flexible, mobile, and innovative. Many of them are also often competitive and accepting of the market society. Continuously expanding their own range of experiences is a fundamental tenet for them. Despite their enthusiasm for fun in their free time, they also want to achieve something in their work life ("Movers & Shakers"). They live according to the motto: "work hard, play hard." Their everyday life is often jam-packed because they don't want to miss out on anything.

Expeditives distance themselves from the characteristics of the established middle-class: unchallenged pursuit of conventions, subordination of fun and personal fulfilment in favour of security, fear of attracting attention, and change. They also don't want to be forced into ideological corsets and are not control or authority-oriented. They are just as distanced from values of submission as they are from ascetic values and conservative ideas of morality.

In this lifeworld, diversity and difference are celebrated. Expeditives' go to great efforts to distance themselves from the mainstream. Yet they are less "dogged" and rigorous than Experimentalists. Their efforts for distinction appear less like rebellious fighting than as a natural result of their "obvious" intellectual and stylistic superiority (in particular compared against others of the same age).

Expeditives travel a lot in their free time. They flock outside to public spaces and hot locations, wherever music is playing and the people are exciting and different. Expeditives dream of a lively cultural life and the freedom of global metropolises. In Germany, they just love Berlin.

Last but not least, Expeditives are very focused on education. In this lifeworld, education occurs both deliberately – in school and during free time – and en passant. If they are interested in a particular issue, they take it as a matter of course to find out lots of information about it, by reading a specialised book, doing research on the Internet, or visiting an exhibition.

1.3 Brochure explanations

The survey results of the 2020 Youth Nature Awareness Study are presented in the following chapters. Central findings are shown in diagrams and tables. For questions with a multi-level response scale, four-point or five-point scales are predominantly used: The first two categories indicate the degree of agreement (e.g. "agree strongly"/"agree somewhat") and the last two levels indicate the degree of disagreement ("disagree somewhat"/"don't agree at all"). On a five-point scale, the middle category ("partly agree/partly disagree") shows that the respondent is undecided. The "don't know/no answer" category was selected when the respondent was unable or unwilling to assess a question or statement.

To ensure legibility and comprehensibility, decimal places have been omitted from the specified percentage values and the figures rounded up to the nearest whole number. If the sum of the figures for all answer categories was more or less than 100 percent as a result, an adjustment of up to 1.4 percentage points was made in the "don't know/no answer" category. In very rare cases, this approach was not sufficient and the highest value also had to be adjusted slightly.

The data set was examined for differences in the response behaviour of different characteristics groups. The following socio-demographic characteristics of the young people surveyed were considered here: gender, age (14 and 15 years old, 16 and 17 years old), level of formal education (low, medium, high)[8], and BIK size of town (number of inhabitants less than 20,000, 20,000 to 100,000, 100,000 to 500,000, 500,000 and above)[9]. The Sinus milieu indicator for young people's lifeworlds was integrated into the questionnaire in order to allow an evaluation according to the lifeworlds of young people, as described in Chapter 1.2. Significant differences are explained in the text. In addition, particularly interesting findings are graphically presented in figures or tables.

Established test methods of empirical social research were used to check the statistical significance of the survey data. Differences in the response behaviour of different characteristics groups were examined using the chi-squared test (see also Eid 2013, Janssen and Laatz 2010, or Sedlmeier 2013). This is based on a confidence interval of 95 percent (over or under-represented) or 99 percent (significantly over or under-represented), which is customary for social science purposes. Accordingly, traits in the random sample are interpreted as over-represented (above-average) or under-represented (below-average) if the probability is at least 95 percent (significance level of $p < .05$). Traits are interpreted as significantly over-represented or significantly under-represented if a probability of 99 percent (significance level of $p < .01$) can be assumed. Over-representation and under-representation are colour-coded in the figures and tables and explained in the legend. It should be noted that the results of the significance tests are also dependent on the size of the group being studied. The larger the group being studied (e.g. boys or girls), the more likely it is to prove the significance of slight over-representations or under-representations (see Janssen and Laatz 2010, page 276). For this reason, in some cases, identical numerical values are shown as being under-represented or over-represented to varying degrees.

The degree of agreement with a question as well as the frequency with which a characteristic occurs in the group being studied were colour-coded – as described above – and explained in the legend. The numbers are also colour-coded: In the case of over-represented values and agreements (e.g. "agree strongly"/"agree somewhat"), the numbers are presented in black; for under-represented values and disagreements ("disagree somewhat"/"don't agree at all"), the numbers are presented in white. Thus, even with a black and white printout, all colour codings are distinguishable from each other. In the case of the diagrams of the young people's lifeworlds, the overlapping areas between two lifeworlds are marked in the colour of the lifeworld that has the higher percentage value of the response category that is to be represented.

It is only possible to make limited comparisons between the data of the 2020 Youth Nature Awareness Study presented here and primarily collected online, and the previously published data of the adult nature awareness study from face-to-face interviews. The coronavirus crisis and its associated consequences (in particular social distancing) made it necessary to stop face-to-face surveying of young people in summer 2020. The change of method to a predominantly online survey format, as well as the potential direct influence of the crisis on the respondents' answers, represent imponderable considerations in a direct comparison of otherwise identical questions. Given the circumstances, a limited, in-depth analysis of the comparison between adults and young people will be made in the scientific consolidation report on the 2019/2020 studies. Publication of this report is planned for mid 2021.

For an overview of the responses by all those surveyed as part of this study, see the base count in the Annex. This illustrates all of the survey topics in table form in the order in which they appeared in the questionnaire.

2 The connection between humans and nature – important for a good life

It goes without saying that the term "nature" is central to a youth nature awareness study. At the same time, there is hardly any other term that is more difficult to grasp. It is too steeped in tradition for a simple, standardised definition, too ambiguous, too loaded with hopes, fears, and normative expectations.

What young people understand by nature and how they assess the connection between humans and nature are central to this chapter. In social and educational science research and in pedagogical practice, nature and its significance to young people's development have not yet been given the broad attention they warrant. After all, it is widely known that nature occupies a central role as a realm of experience and instance of meaning for the health and wellbeing of young people (see Gebhard 2020).

Young people's image of nature and their experiences of nature are influenced through their social and geographical position (town/country), the attitudes and practices of their parents and peer group towards nature, in-school and out-of-school educational offerings, and media usage and the time available to them. The experiences that children and young people have with and in nature significantly shape attitudes and behaviours related to the environment and nature conversation (see Broom 2017). The understanding and appreciation of biodiversity amongst adults is therefore especially influenced by childhood experiences (see Beery and Jørgensen 2016). A study from rural Canada was able to show that children's image of nature is strongly shaped by their day-to-day environment and the activities within it – whereby nature is understood as a connected whole and not merely as a collection of different natural elements. Spending time in nature is also specifically used by children to increase their own wellbeing (see Tillmann et al. 2018).

However, there are many developments that appear to work against a positive relationship between young people and nature. The general trend towards technologisation and specifically digitalisation, more frequent media use, urbanisation processes, and the predominance of cognitive knowledge transfer over practical experience of nature are often held responsible for young people becoming increasingly estranged from nature and natural contexts (see Brämer et al. 2010). In a study on the understanding of nature, it was shown that almost a quarter of the children and young people surveyed had no idea of how they could contribute to nature conservation (see Kleinhückelkotten et al. 2017).

With this in mind, a leading question in this study is what young people even understand by "nature". Furthermore, it is shown below which personal significance young people assign to nature, how they assess the endangerment of nature and the protection of nature, and where they see nature conservation in the conflicting priorities of politics and economics.

2.1 What is nature?

In order to investigate the question of what young people understand by the term "nature", they were asked to freely and spontaneously express what comes to mind when they think about nature and what nature is to them. They were requested to specify as many terms as came to mind.

When it comes to nature, young people most often think of wildlife and plant life.

In terms of the answers to the open question, the category of "wildlife" comes first (see Figure 2). The term that was mentioned most frequently by far was "animals" (52 percent). Groups of animals were mentioned far less often, such as birds (five percent), insects (four percent), wild animals (for example foxes, wild boar, bears: three percent), mammals (one percent), bees (one percent), or fish (one percent).

Young people think of "plant life" almost as often as they do "wildlife" (60 percent). In addition to the term "plants" (39 percent), they primarily mention trees (21 percent). The association "green/lots of greenery" also arises often in this connection (twelve percent). Flowers were mentioned in four percent of responses, grass/grasses/lawns and fungi each achieved two percent, and plant diversity one percent.

The category "Recreation, leisure, and experiencing nature" took third position among the most frequent responses (52 percent). In this category, young people primarily think of relaxation/unwinding (22 percent), good/fresh/clean/healthy air (18 percent), freedom (15 percent), and peace and quiet (14 percent). Two percent each think of excursions, hiking, or going for walks, of health, and of joy/fun/being happy. Holiday, adventure, watching animals, sport/activity, and wellbeing were each mentioned by one percent of those surveyed. Pleasure, good odour, and "nature as a retreat" are also associations in this category (one percent each).

The category "landscape/nature & landscape objects" drew 50 percent of responses. Within it, the term "landscape" was mentioned far less frequently (three percent) than its individual components – especially forests (21 percent), wilderness (seven percent), meadows (six percent), the biosphere (six percent), and untouched nature (five percent). Three percent of those surveyed think of "everything that surrounds us", two percent each of "everything natural" and mountains/Alps, undeveloped areas/landscape, and the ecosystem. All other landscape objects were mentioned less often (including parks and stones/minerals with just one percent of mentions).

The category "bodies of water/lakes" with a total of 13 percent of mentions includes the associations "water/bodies of water" (six percent), "lakes" (six percent), "river/rivers" (three percent), and "streams/brooks" (one percent).

Many young people also associate nature with its need for protection.

With 13 percent of responses, young people also mention environmental, nature, and animal conservation when they think of nature. It is not only the term "environmental/nature conservation" that crops up (two percent). They often spontaneously refer to the fact that nature is "necessary/irreplaceable" (three percent), "must be protected" (three percent), is the "basis for human life" (two percent), and that nature is "important for future generations" (one percent). One percent of those surveyed think of protected areas. In a few cases, they also explicitly spoke out against rubbish/pollution/plastic (one percent).

In addition to mentioning environmental, nature, and animal conservation, the respondents also spoke of the destruction of nature and environmental destruction. Overall, seven percent of responses refer to this category. Of these, three percent think of the threat to nature and the environment and one percent each of nature/environmental catastrophes, environmental pollution, and climate change.

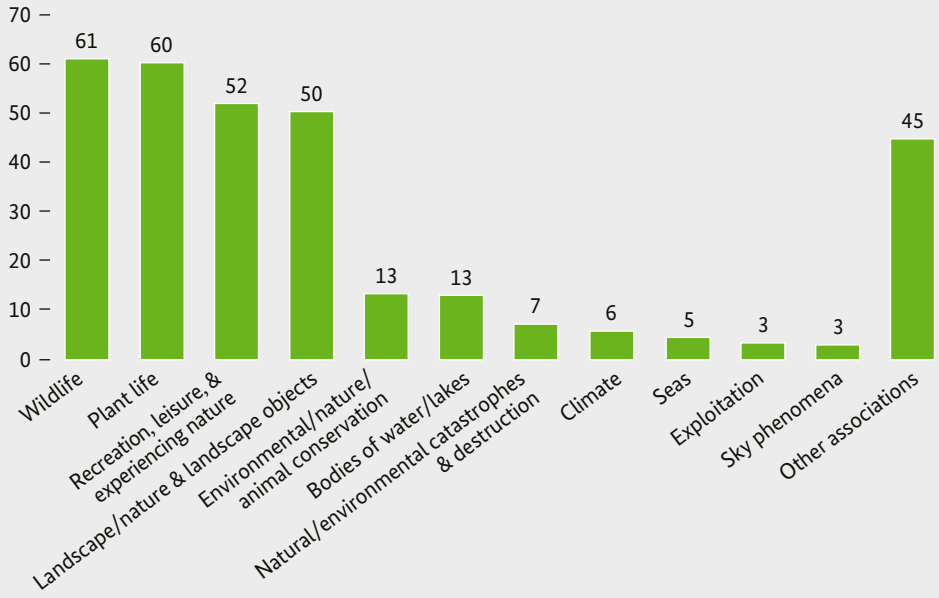
Six percent of mentions refer to the category of "climate". Alongside the term "climate" (two percent), weather is also mentioned (two percent). Also in this connection, young people think of the seasons (one percent) and weather phenomena such as precipitation/rain/snow (one percent) and wind/tornadoes (one percent).

A total of five percent of responses fall into the category "seas". Alongside sea/ocean (four percent), some individuals think of beach/beaches (one percent).

The category "exploitation of nature" accounted for three percent of responses. Respondents thought here of aspects such as fields (two percent) and agricultural products like fruit and vegetables (one percent). Another category that made up three percent of responses is

Figure 2: Associations with nature

What spontaneously comes to mind regarding the topic of nature? What does nature mean to you? Please list as many terms as you can think of.



Data in percent

"sky phenomena": sun/sunrise/sunset (two percent) and sky/clouds (one percent) were mentioned here.

The category "other associations" (45 percent) covers responses that cannot be summarized further. Individual terms, however, come up frequently, in particular the terms "beauty" (15 percent), "species diversity" (eleven percent), and "living beings" (eight percent). The associations "wonder/unusual/unique" (three percent), "everything that has not been created by human beings" (three percent), "peace" (three percent), "purity/pure/clear/cleanliness" (three percent), "Earth/our Earth" (two percent), and "homeland/at home" (one percent) are also voiced here.

It is worthy of note that the term "nature" gives rise to a wide range of associations among young people. It is not only animals, plants, seas, and their own experience of nature that come to mind here; the endangerment of nature and its need for protection is also spontaneously associated with the topic of "nature".

2.2 Personal understanding of nature

For young people in Germany, nature is part of a good life.

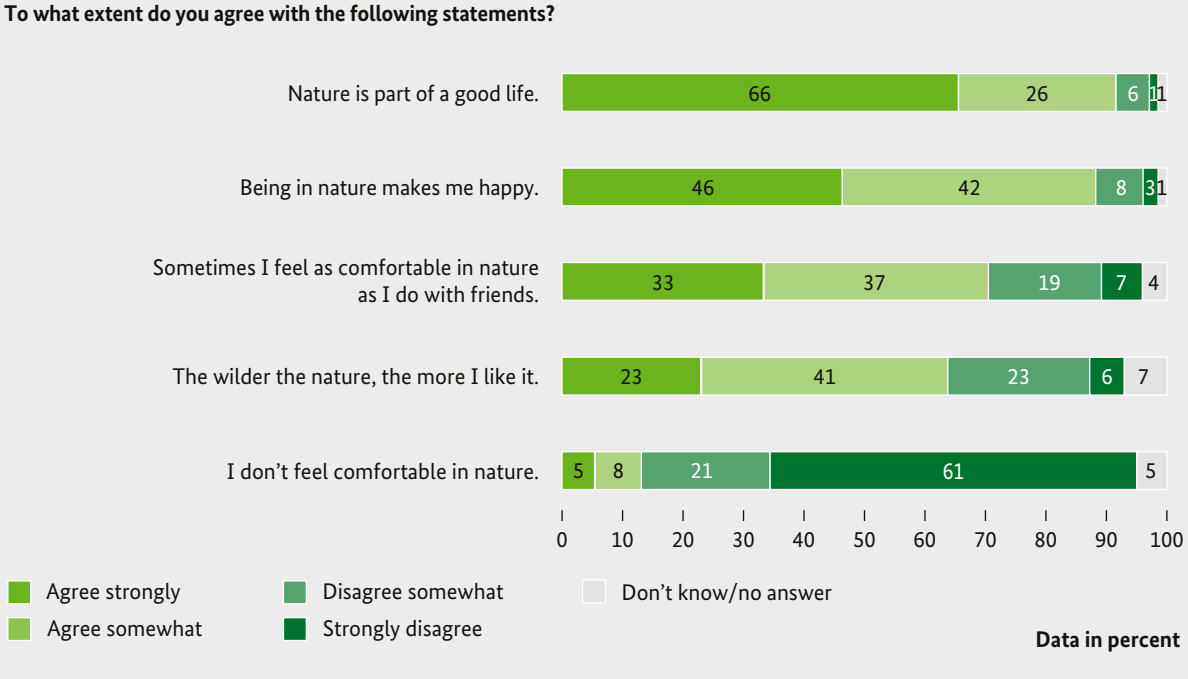
Nature has great importance in life for young people (see Figure 3): For 92 percent, nature is part of a good life (both approval levels), 88 are happy to be in nature, and 70 percent sometimes feel as comfortable in nature as they do among friends. Many also have a fondness for untouched nature, as 64 percent like nature better the wilder it is. Conversely, only a small number of young people feel uncomfortable in nature (13 percent).

Girls place stronger emphasis on the personal importance of nature than boys: They are "strongly" of the opinion that nature is part of a good life (74 percent and 58 percent respectively), it makes them happy to be in nature (highest approval level: 57 percent and 35 percent respectively), and they sometimes feel as comfortable in nature as they do with friends (41 percent and 25 percent respectively). A comparison of education level further shows that young people with a high level of formal education unreservedly state more often than average that nature is part of a good life (highest approval level: 71 percent, average: 66 percent).

In the lifeworld of Materialistic Escapists, the personal appreciation of nature is lowest.

In looking at the lifeworlds of young people, it is striking that the personal appreciation of nature is greatest in the lifeworld of the anti-consumerist Postmaterialists and in the social middle of the youth population – among the Adaptive Pragmatists. Hence, 91 percent of Postmaterialists and 81 percent of Adaptive Pragmatists stress that nature is part of a good life (highest approval level, average: 66 percent). Materialistic Escapists,

Figure 3: Personal understanding of nature



whose leisure time is markedly hedonistic, are far less convinced of this (42 percent). What is more, it is conspicuous that, in addition to Adaptive Pragmatists and Postmaterialists, the modest and homeland-oriented Conservative Mainstream emphasise more often than average that it makes them happy being in nature. In the lifeworlds of the lifestyle-oriented Expeditives and the Materialistic Escapists, the figures are significantly lower (see Figure 4).

2.3 Endangerment and protection of nature

Young people are angry about the careless treatment of nature.

Ninety percent of the young people surveyed are angry that so many people treat nature so recklessly (both approval levels). Of these, 91 percent are of the opinion that it is the duty of humans to protect nature. Furthermore, 88 percent think we may only use nature in such a way that affords coming generations the same opportunity, 87 percent state that nature conservation is necessary in order to meet the challenges of climate change, and 81 percent demand that we should follow the laws of nature more closely (see Figure 5).

Girls and young people with a higher level of formal education are particularly sensitive to the endangerment and protection of nature.

Differences in the response behaviour of the young people become apparent in the comparison of the genders and education level: More girls than boys stress their anger at the endangerment of nature (highest approval level: 66 percent and 46 percent respectively), think explicitly of future generations (among other things) (67 percent and 54 percent respectively), and see it as the duty of humans to protect nature (72 percent and 58 percent respectively). Young people with a high level of formal education more often express their anger strongly than young people with a lower level of formal education (highest approval level: low education level: 48 percent, medium education level: 50 percent, high education level: 63 percent). In addition,

Figure 4: Personal understanding of nature according to lifeworlds

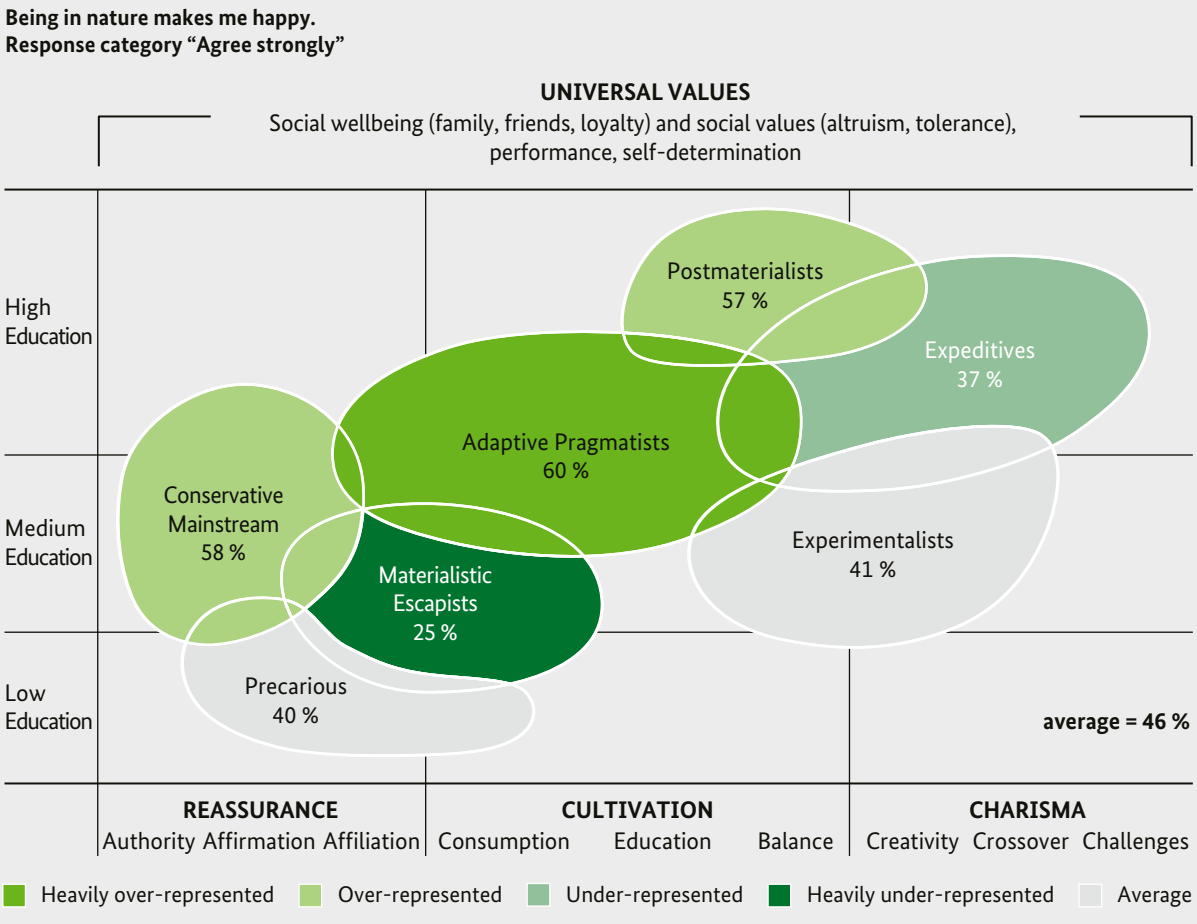
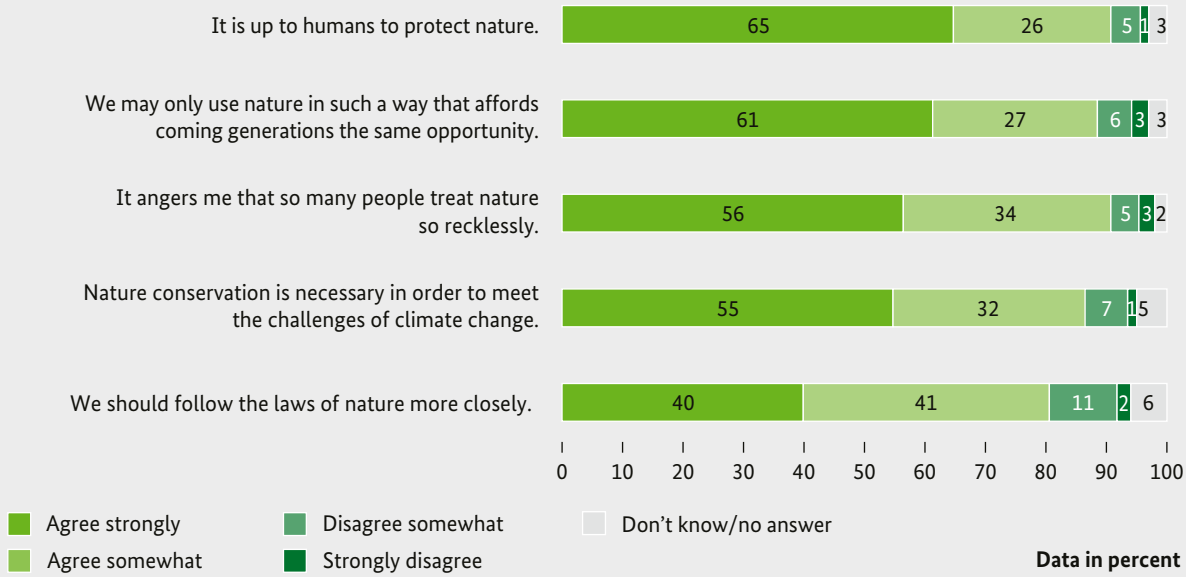


Figure 5: Attitudes towards the endangerment and protection of nature

To what extent do you agree with the following statements?



they stress the necessity for nature conservation more frequently than average for those surveyed (see Table 1).

A clear picture emerged in the comparison of the lifeworlds: The greatest awareness of the endangerment and protection of nature is in the lifeworlds of the well-educated Postmaterialists and the Adaptive Pragmatists, plus the conscientious Conservative Mainstream are more sensitive to this issue than average. For example, 84 percent of Postmaterialists, 67 percent of Adaptive Pragmatists, and 65 percent of the Conservative Mainstream are specifically angry about the careless treatment of nature (highest approval level: average: 56 percent). Awareness is less among Precarious young people and particularly Materialistic Escapists. In these lifeworlds, 44 percent and 27 percent respectively are very angry.

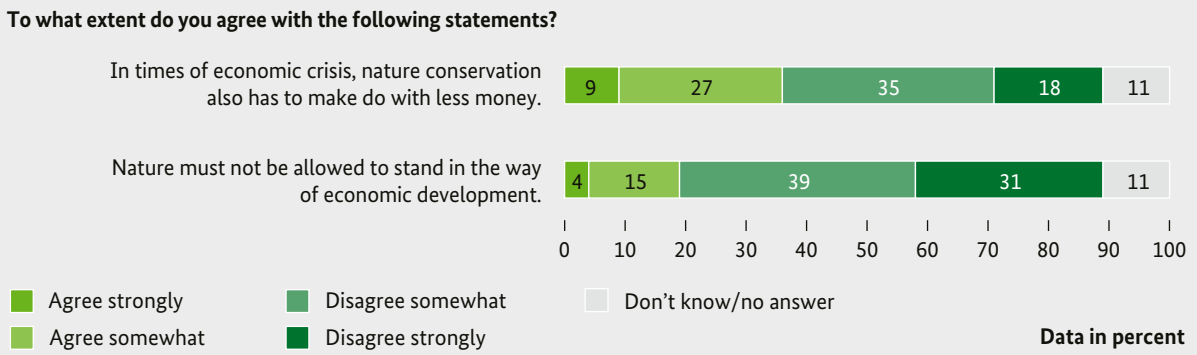
Table 1: Attitudes towards endangerment and protection of nature by gender and educational level

To what extent do you agree with the following statements?

Response category: **Strongly agree** Data in percent	Average	Gender		Educational level		
	Ø	M	F	Low	Medium	High
It is up to humans to protect nature.	65	58	72	54	59	71
We may only use nature in such a way that affords coming generations the same opportunity.	61	54	67	45	53	69
It angers me that so many people treat nature so recklessly.	56	46	66	48	50	63
Nature conservation is necessary in order to meet the challenges of climate change.	55	51	58	40	46	64
We should follow the laws of nature more closely.	40	35	45	42	36	43

Heavily over-represented · Over-represented · Under-represented · Heavily under-represented

Figure 6: Nature conservation caught between politics and economics



2.4 Nature conservation caught between politics and economics

Only a minority puts economic development before nature – and the same applies in times of crisis.

Nineteen percent of young people are of the opinion that nature must not be allowed to stand in the way of economic development (both approval levels, see Figure 6), however, a significant majority of 70 percent does not share this view ("somewhat disagree"/"strongly disagree"). The question of whether nature conservation also has to make do with less money in times of economic crisis meets with agreement in 36 percent of young people ("strongly agree"/"somewhat agree") while the majority of 53 percent again reacts with rejection ("somewhat disagree"/"strongly disagree").

Those most likely to agree that nature must not be allowed to stand in the way of economic development are young people with a low level of formal education (both approval levels: 32 percent). In the comparison of lifeworlds, it is the socially disadvantaged Precarious young people who most often agree here at 32 percent (both approval levels), while agreement among Postmaterialists reached only eight percent.

3 Youth and the relationship with nature during the coronavirus crisis

The coronavirus crisis of 2020 has significantly impacted the life of young people. The additional data gathered in this chapter (see introduction) is therefore an important expansion of the first study on youth nature awareness. As explained in the introduction, young adults aged between 18 and 24 were also included in the basic population of this part of the study in addition to young people aged 14 to 17.

There is also increasing evidence in support of the scientific hypothesis that the originator of the coronavirus crisis, the SARS-CoV-2 virus, is probably a product of the endangerment and destruction of nature by humans around the world: Deforestation in Southeast Asia is causing bat species, farm animals, and people to live in ever closer proximity, which means that the high concentration of viruses in bats can transfer more easily to farm animals and humans. With the coronavirus, it is likely that endangered pangolins at Chinese wet markets (markets that trade wild animals, such as in Wuhan) played the role of carriers (see Cazzolla Gatti 2020 and Lambertini et al. 2020). The predecessor virus SARS, Ebola, swine flu, or bird flu came about in similar ways. Thus, the coronavirus raises questions about our "seemingly limitless utilitarian relationship with nature" (Tretter et al. 2020, page 83) and forces us to take nature conservation more seriously. This raises the question of whether young people and young adults draw a connection between these issues or whether the coronavirus has no relation to the issue of nature conservation for them.

Yet the connection between the coronavirus crisis and nature runs deeper: During the peaks of the coronavirus crisis, lockdowns were introduced to shut down large parts of public life, including many cultural and leisure facilities, and at times schools. This took away opportunities and venues for physical meetings from many young people – for an age group for which relationships with others of the same age, their peer group, is especially important. The only thing that offered a respite from family and digital formats during this time was the outdoors, where people were able to spend time alone or with members of their own household. Of course, this begs the question: Has the coronavirus crisis altered the behaviour of young people and young adults with regard to nature and their attitudes to nature? This question is also examined below.

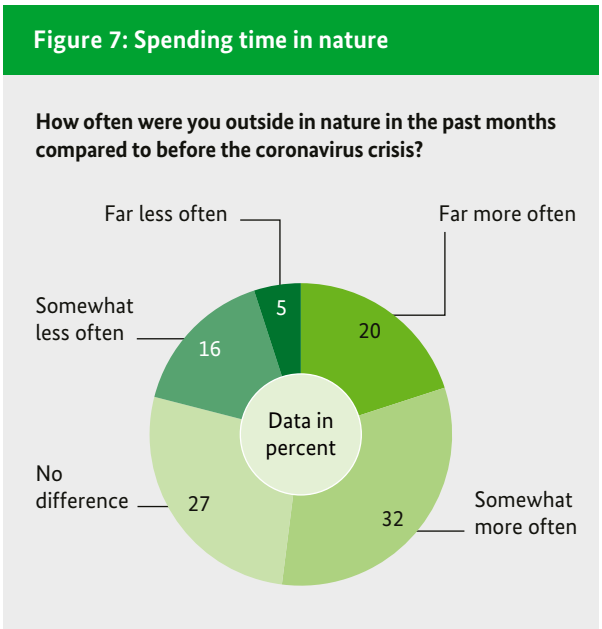
3.1 Leisure time in nature

Before the young people answered questions about "leisure time in nature", it was explained to them that the term "nature" was to be understood in very broad terms in the context of this question: "By nature, we mean forest, meadows, fields, or even parks."

Every second respondent spent more time in nature during the coronavirus crisis than before the pandemic.

Irrespective of age, gender, education level, and town size, 52 percent of the young people and young adults surveyed stated that they had been in nature more often in the last months than before the coronavirus crisis. Twenty percent even said that they had been in nature "far more often". This is compared to 21 percent who claimed to have spent less time in nature over the past months. Twenty-seven percent had been in nature just as often as before the pandemic (see Figure 7).

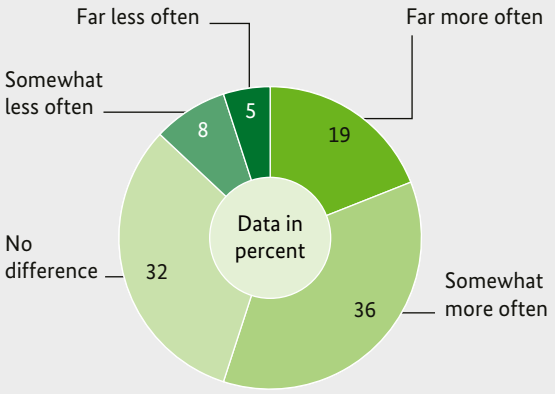
Figure 7: Spending time in nature



In response to the question of whether they had consciously spent time in nature more often than before in order to distract themselves, relax, or relieve stress, 19 percent of young people responded "far more often" and another 36 percent "slightly more often". While

Figure 8: Distraction, relaxation, and stress relief in nature

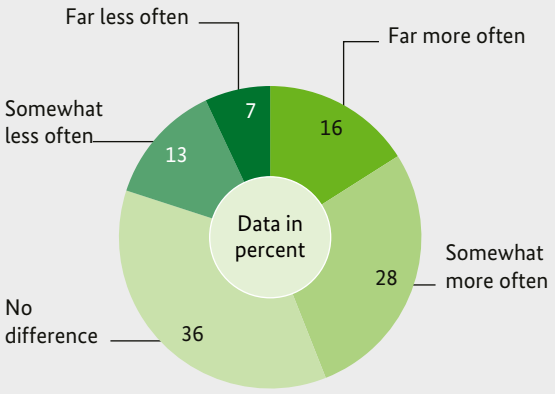
How often did you consciously go outside in nature in the past months to distract yourself, relax, or relieve stress compared to before the coronavirus crisis??



eight percent answered "somewhat less often" and five percent "far less often", 32 percent didn't notice any difference from the time before the coronavirus crisis (see Figure 8). The sociodemographic analysis reveals that in the group of those who consciously went outside into nature "far more often" to distract themselves,

Figure 9: Exercise and sport in nature

How often did you consciously go outside in nature in the past months to exercise and do sport compared to before the coronavirus crisis?



relax, or relieve stress, young people and young adults who live in villages and small towns are under-represented (population below 5,000: 14 percent). In the group of those who noticed no difference, the youngest respondents (14 to 17-year-olds) are over-represented (38 percent).

Forty-four percent of those surveyed more often consciously spent time in nature for activity and sport during the past months than before the coronavirus crisis (16 percent "far more often", a further 28 percent "somewhat more often"). In the group of young people and young adults with a high level of formal education, the figure is 51 percent. Conversely, 20 percent of those surveyed claim to have consciously spent less time in nature for sport (seven percent "far less often", a further 13 percent "somewhat less often"). This means that the crisis has influenced activity behaviour in both directions, however far more often in a positive direction. The remaining 36 percent were in nature to do sport just as often in the past months as before the coronavirus crisis (see Figure 9).

3.2 Personal appreciation of nature

Appreciation of nature has increased for the majority of young people and young adults during the coronavirus crisis.

For 52 percent of those surveyed, nature has become more important compared to the time before the coronavirus crisis (18 percent "far more important", a further 34 percent "somewhat more important"). Forty-five percent claim that the personal importance of nature for them has not changed. Only a fraction of three percent considers nature to be slightly less important than before the coronavirus crisis (see Figure 10).

Figure 10: Altered appreciation of nature

Has the importance of nature to you changed compared to before the coronavirus crisis?
For me, nature is now ...

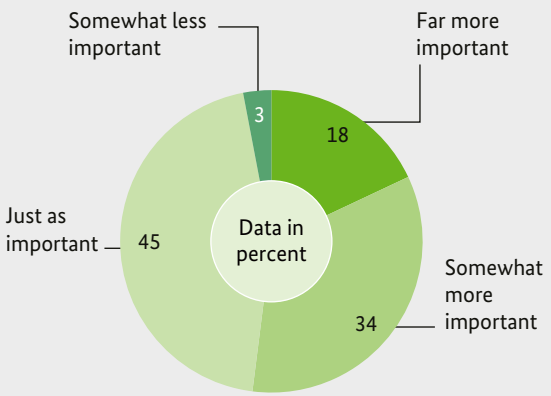
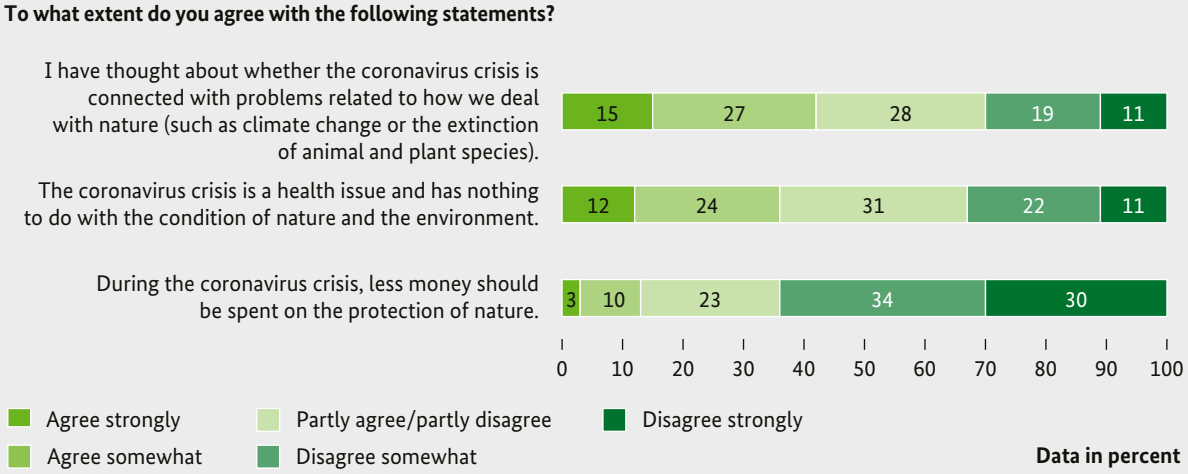


Figure 11: Attitudes to the connection between the coronavirus crisis and the condition of nature and the environment



3.3 Connections between the coronavirus crisis and the condition of nature and the environment

The question of whether the coronavirus crisis is connected with the condition of nature and the environment elicited ambivalent responses.

Forty-two percent of the young people and young adults surveyed claim to have thought about whether the coronavirus crisis is connected with problems related to how we deal with nature (both approval levels). Conversely, 36 percent are of the opinion that the coronavirus crisis is a health issue and has nothing to do with the condition of nature and the environment. Almost as many, namely 33 percent, disagree with this view. The remaining 31 percent are undecided on this question (see Figure 11).

Differentiated by sociodemographic characteristics, it becomes clear that boys and young men are more often of the opinion than girls and young women that the coronavirus crisis is a health issue and has nothing to do with the condition of nature and the environment (both approval levels: 43 percent compared to 30 percent). Furthermore, looking at the highest approval level shows that young people with a low level of formal education are more than averagely likely to be "strongly" convinced that there is no connection between the coronavirus crisis and the condition of nature and the environment (highest approval level: 18 percent: average: twelve percent).

The call to spend less money on protecting nature in the coronavirus crisis meets with rejection from two thirds of young people and young adults.

Only three percent of those surveyed "strongly" agree with the statement that less money should be spent on protecting nature during the coronavirus crisis. Ten percent agree "somewhat". These 13 percent in total who agree contrast with 64 percent who disagree "somewhat" (34 percent) or "strongly" (30 percent). Twenty-three percent are undecided (see Figure 11).

Whether the respondents disagree with giving lower priority to the protection of nature during the crisis depends greatly on their level of education: In the group with a low level of formal education, 40 percent disagree with spending less money on protecting nature during the coronavirus crisis. By contrast, in the group of respondents with a medium education level, the figure is 66 percent and some 71 percent in the group with a high education level.

4 Biodiversity – awareness of progressive decline

Nature's diversity is one of its most admired attributes. It is most visible in the wealth of species and habitats, yet to a scientific eye it also reveals an astonishing level of genetic diversity. There are many different benefits of biodiversity for humans which are often not immediately apparent, and awareness of them must continuously be raised: Diverse nature offers a broad range of nutrients and raw materials; intact ecosystems provide us with an array of ecosystem services (for example keeping water and air clean, pollination, storing carbon dioxide [CO_2]); the genetic diversity of nature is the basis for breeding better species of farm animals and plant species, and ensures better adaptation to climatic changes; many species of plants and animals provide inspiration for new technical inventions (bionics); and finally, a diverse natural environment is important for recreation and wellbeing. The National Strategy on Biodiversity adopted in 2007 endeavours to cater to all of these aspects. A status report after ten years reveals the successes as well as the challenges that remain to be overcome (see BMU 2018).

Since 2009, more than 32,000 native animal, plant, and fungus species have been examined more closely with regard to their endangerment in Germany's Red Lists, almost 11,000 of them taxa (species and subspecies). Of these taxa, around 29 percent are threatened and 5.6 percent are extinct (see BfN 2020). There are many reasons for the endangerment of biodiversity: intensive agriculture and the use of agrochemicals, over-fertilisation of fields, eutrophication of bodies of water, expansion of settlement and traffic areas at the cost of green and open spaces, but also climate change.

Yet it should also be noted that societal sensitivity to the problem of declining biodiversity has increased in recent times. This is evident not only in the form of book publications, which bring the issue into the public arena (see Angres and Hutter 2018, Busse 2019, Segerer and Rosenkranz 2017), but also from noticeably stronger civic commitment to preserving biodiversity. One example is the Bavarian initiative for species diversity ("Save the bees!"), which drew nationwide attention and was supported by a broad alliance and 1.8 million citizens. At the start of August 2019, it was adopted by the Bavarian state parliament in Munich along with accompanying legislation and a comprehensive bundle of measures.[10] But is the loss of biodiversity also an issue which worries young people? Are they even aware of the term "biodiversity"? And are they aware of the decline in biodiversity?

In view of these questions, this chapter investigates how familiar young people are with the term "biodiversity" and what young people understand by it. We also wanted to know whether and how strongly young people are convinced that biodiversity on Earth is in decline.

4.1 Awareness and understanding of the term

Two out of three young people do not know what the term "biodiversity" means.

Thirty-five percent of the young people surveyed claim to know what the term "biodiversity" means. This stands in contrast to 48 percent who are aware of the term but do not know what it means, twelve percent who have never heard of the term "biodiversity", and five percent who are not sure (see Figure 12).

It is primarily young people with a high level of formal education who claim to know the meaning of biodiversity. Young people with a lower level of formal education state this far less often (low education level: 16 percent, medium education level: 28 percent, high education level: 42 percent).

The comparison of lifeworlds reveals that the meaning of biodiversity is most widely known among information-hungry Adaptive Pragmatists (46 percent). In the less educated lifeworlds of the Precarious and Mate-

Figure 12: Familiarity with the term "biodiversity"

Are you familiar with the term "biodiversity"?

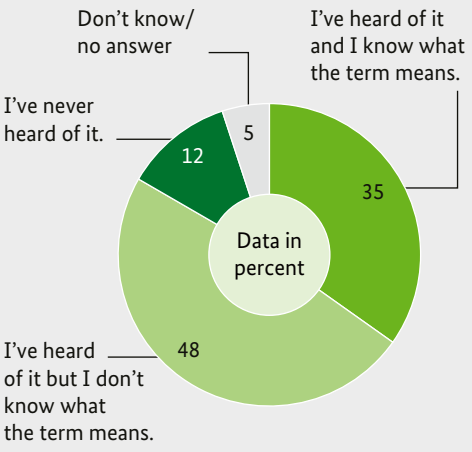
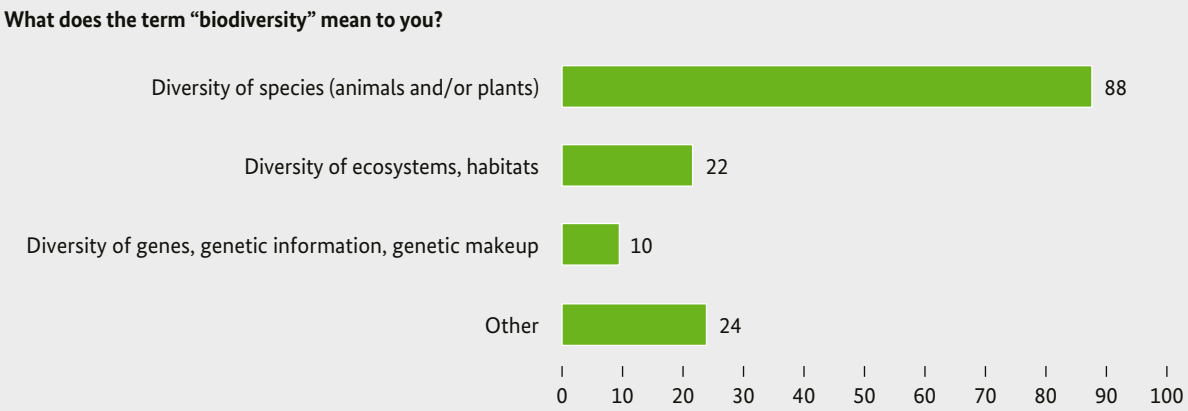


Figure 13: Understanding of the term "biodiversity"



Basis: 346 cases; only respondents who claim to know what "biodiversity" means

Data in percent

rialistic Escapists, however, significantly fewer young people know the meaning of the term (23 percent and 17 percent respectively).

Young people primarily associate diversity of species with biodiversity.

Eighty-eight percent of the young people who know the term "biodiversity" associate it with the diversity of animal and plant species. Twenty-two percent also think of the diversity of ecosystems and habitats. It is most frequently the 14 to 15-year-olds (32 percent) and young people with a low level of formal education (42 percent) who associate biodiversity with the diversity of habitats. Only ten percent of those who were familiar with the term know that biodiversity also includes the diversity of genes, genetic information, and genetic material (see Figure 13, multiple answers possible).

4.2 Perceived decline of biodiversity

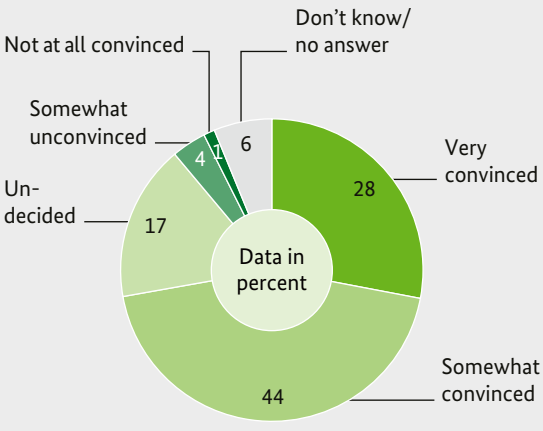
After answering the questions regarding their awareness and understanding of the term "biodiversity", all the young people were given a definition of biodiversity to read to ensure that they all had the same understanding of what biodiversity means.[11] They were then asked about the perceived decline of biodiversity.

Over 70 percent of young people are convinced that biodiversity is in decline.

Seventy-two percent of the young people surveyed are convinced that biodiversity on Earth is in decline, while just five percent state that they are (somewhat) unconvinced of this. A further 17 percent are undecided and six percent are unable to give an answer (see Figure 14). It is apparent that the perceived decline in biodiversity increases with the young people's level of education: In the group with a low level of formal education, 55 percent are strongly or at least somewhat convinced of the decline in biodiversity. In the group with a medium level of formal education, the figure is 64 percent and in the group with a high level of formal education, it is 81 percent.

Examining the young people's lifeworlds shows that those particularly sensitive to the endangerment of biodiversity are the nature conservation-oriented Postmaterialists ("strongly/somewhat convinced": 84 percent) and the Adaptive Pragmatists (81 percent), who describe themselves as responsible and see realistic evaluations as one of their strengths. By contrast, the problem of declining biodiversity is least present in the strongly hedonistic lifeworld of Materialistic Escapists (53 percent).

Figure 14: Perceived decline of biodiversity



5 Species knowledge – better transfer of knowledge required in schools

Biodiversity is a key term in nature conservation (please also refer to the chapter "Biodiversity"). Alongside the genetic level and that of habitat, the level of species plays a central role. Species knowledge is a key to understanding natural relationships and is a foundation for preserving biodiversity.

However, many studies show that species knowledge in society is diminishing. Even at schools and universities, dealing with taxonomic questions is a relatively minor subject. As a result, observers speak of "dying out of the experts" in Germany (see Frobel and Schlumprecht 2014, Gerl et al. 2017, Schulemann-Maier and Munzinger 2018, Schulte et al. 2019).

There are also deficits in species knowledge among young people. Investigations show that school pupils know only a few plant and animal species: According to surveys, young people know on average 4.2 out of twelve bird species (see Zahner et al. 2007) and just 3.7 out of twelve tree species (see Dachs et al. 2009). There are particular deficits in the species knowledge of native wild herbs (see Jäkel and Schaer 2004). Overall, knowledge has deteriorated further in the past ten years (see LBV 2018).

With this in mind, two main methods have been developed to counter this in recent years: in-school and out-of-school education "directly in nature" and the use of digital media to educate about nature and nature conservation (please also refer to the chapter "Digitalisation"). Real spaces for experiencing nature are extremely important in furthering children's knowledge of biodiversity – even if they are species-rich private gardens, as is the case for city children (see Freeman et al. 2018). Early childhood experiences with urban biodiversity further people's willingness as adults to tolerate species that are not just "nice" and "fluffy" (see Hosaka et al. 2017).

Recently, attempts have been made to combine both approaches so that digital media are used during activities in the outdoors, for example to identify species or to better understand the local conditions and natural habitats (see Knoblich 2020, Lude et al. 2020, Wäldchen et al. 2016). Currently, most of these projects are of a pilot nature, so the question of whether such efforts are able to counter an "erosion of species knowledge" remains unanswered for the time being.

This chapter deals with three questions regarding species knowledge: How do young people rate their own species knowledge? How interested are they in species knowledge? In their opinion, which learning facilities would be suitable for communicating more knowledge of species diversity?

5.1 Assessment of own species knowledge

To find out how young people rate their own knowledge of animal and plant species, they were asked to give a self-assessment. In addition, they were asked whether they would like to know more about animal and plant species.

The vast majority would like to know more about animal and plant species.

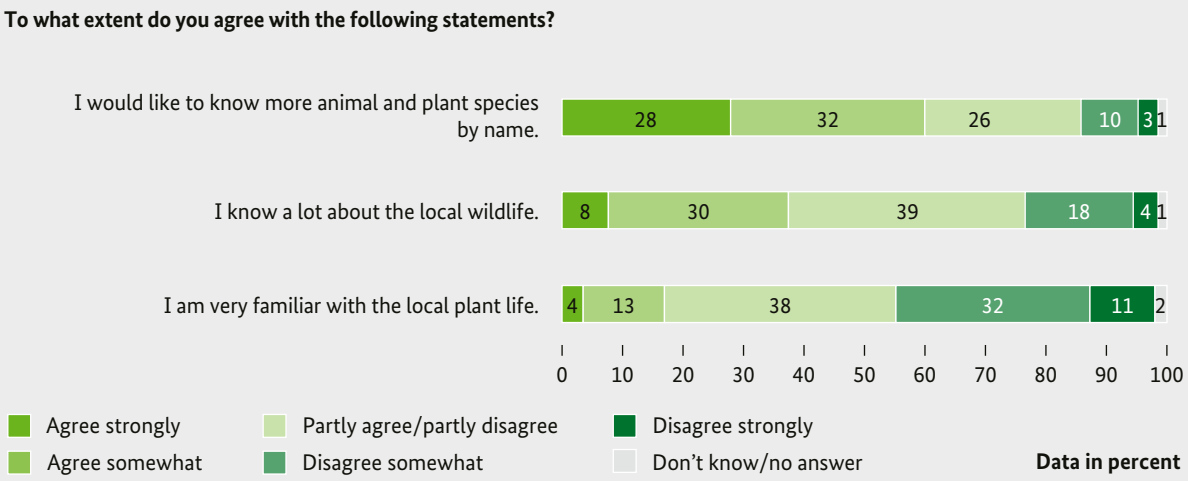
Sixty percent of young people would like to know more animal and plant species by name, with 28 percent claiming to agree strongly with this. Twenty-six percent were undecided on this question ("partly agree/partly disagree"), only 13 percent are (somewhat) disinterested (see Figure 15).

Eight percent are unreservedly of the opinion that they know a lot about the local wildlife, a further 30 percent agree "somewhat", while 18 percent "disagree somewhat" and four percent "don't agree at all". Most young people – 39 percent – feel unsure on this question ("partly agree/partly disagree").

Slightly fewer young people claim to be very familiar with the local plant life: Only four percent are convinced that they are very familiar with the local plant life, 13 percent "agree somewhat", 32 percent "disagree somewhat", eleven percent "don't agree at all". Again, the number of those who found it difficult to make an assessment was relatively large ("partly agree/partly disagree": 38 percent).

A look at the sociodemographics shows that considerably more girls than boys would like to know more about animal and plant species (both approval levels: 69 percent and 51 percent respectively). Among young people with a low level of formal education, the degree of interest shown is below average (47 percent). It is

Figure 15: Assessment of own species knowledge



also apparent that girls more often claim to know a lot about the local wildlife than boys (43 percent and 32 percent respectively). Furthermore, the comparison of town sizes reveals that young people who live in villages and small towns are most often convinced that they know a lot about the local wildlife (population below 20,000: 48 percent, see Table 2).

In the comparison of lifeworlds, it is the particularly information-hungry Postmaterialists and Adaptive Pragmatist young people who most frequently state that they would like to know more about animal and plant species (both approval levels: Postmaterialists: 72 percent, Adaptive Pragmatists: 70 percent). Less interest is displayed by Materialistic Escapists, who prefer to spend their leisure time shopping, playing video games, and watching series (41 percent).

5.2 Interest in species knowledge

Alongside the general question of whether young people would like to know more about animal and plant species, they were asked which groups of animal and plant species they were particularly interested in. They had to select three from a list of eleven species groups (including fungi).

Every second young person would like to know more about mammals.

Mentioned in 52 percent of responses, mammals were most frequently chosen as one of the three groups about which the young people surveyed would like to know more (see Figure 16). In second place were trees[12] (42 percent), followed by birds (41 percent), flowering

Table 2: Assessment of own species knowledge by gender, education level, and town size

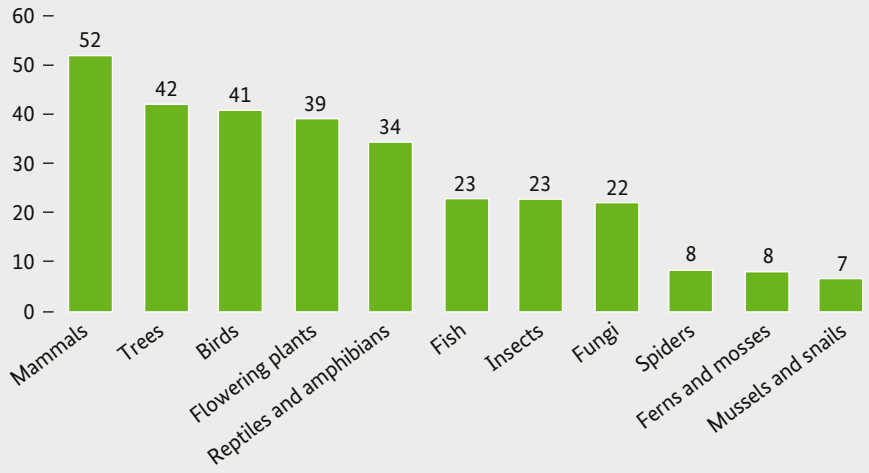
To what extent do you agree with the following statements?

Response category: Agree strongly/somewhat Data in percent	Average	Gender		Educational level			Town size (population)			
	Ø	M	F	Low	Medium	High	<20,000	20,000 to <100,000	100,000 to <500,000	500,000+
I would like to know more animal and plant species by name.	60	51	69	47	59	64	61	58	61	59
I know a lot about the local wildlife.	37	32	43	33	32	41	48	33	38	34
I am very familiar with the local plant life.	17	19	14	11	17	18	17	18	17	17

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

Figure 16: Interest in species knowledge

Please select three species groups about which you would like to know more from the following list.



Data in percent

plants (39 percent), and reptiles and amphibians (34 percent). Fish (23 percent), insects (23 percent), and fungi (22 percent) form a middle group, spiders (eight percent), ferns and mosses (eight percent), and mussels and snails (seven percent) make up the final group.

Differentiated by sociodemographic characteristics, the most obvious difference is between the genders: While more girls than boys claim to be interested in mammals (61 percent and 44 percent respectively) and flowering plants (55 percent and 24 percent respectively), more boys than girls are interested in fish (30 percent and 15 percent respectively), ferns and mosses (twelve percent and four percent respectively), and spiders (eleven percent and five percent respectively). The educational background and age of the young people play a comparatively minor role (see Table 3): Those with a low level of formal education are more than averagely interested in trees (53 percent) and have a lower than average interest in fungi (13 percent). Those with a good level of formal education show less interest than average in spiders (five percent). Furthermore, interest in flowering plants is slightly lower among younger adolescents (14 to 15-year-olds: 33 percent) than among older adolescents (16 to 17-year-olds: 43 percent).

In the comparison of lifeworlds, it is striking that Postmaterialists, who are oriented towards sustainability and the common good, include birds in the three groups they would like to know more about more often than average (54 percent). Their interest in fish, on the other hand, is below average (13 percent). While the order-loving Conservative Mainstream display a lower than average interest in fungi (14 percent), the strongly hedonistic lifeworld of Materialistic Escapists shows comparatively little interest in flowering plants (25 percent). Of all the lifeworlds, Precarious young people have the least interest in mammals (40 percent) and a comparatively large interest in spiders (16 percent).

5.3 Places for learning about species diversity

In order to investigate the question of which places or institutions the young people feel should communicate more knowledge about species diversity, they were given another list of 14 places from which they could choose three.

School was by far the most frequently chosen place for communicating species knowledge.

Sixty-seven percent of young people listed school among the three most important options for communicating knowledge about species (see Figure 17). In second place is the Internet (31 percent), closely followed by zoos and animal parks (30 percent), digital media (29 percent), television (25 percent), and guided nature tours (23 percent). Less than 20 percent of mentions included information available locally (18 percent), general educational institutions (15 percent), botanical gardens (15 percent), family (14 percent), and nature conservation associations (13 percent). Universi-

Table 3: Interest in species knowledge by gender, age, and education level

Please select three species groups that you would like to know more about from the following list.

All responses: Data in percent	Average	Gender		Age		Educational level		
	Ø	M	F	14-15 years	16-17 years	Low	Medium	High
Mammals	52	44	61	51	52	43	51	54
Trees	42	44	40	40	43	53	33	44
Birds	41	41	40	39	42	45	39	41
Flowering plants	39	24	55	33	43	34	31	44
Reptiles and amphibians	34	37	31	36	33	39	37	32
Fish	23	30	15	23	23	28	29	19
Insects	23	23	23	25	21	16	23	23
Fungi	22	24	20	22	22	13	22	25
Spiders	8	11	5	10	7	13	13	5
Ferns and mosses	8	12	4	11	6	9	9	7
Mussels and snails	7	8	6	8	6	4	9	6

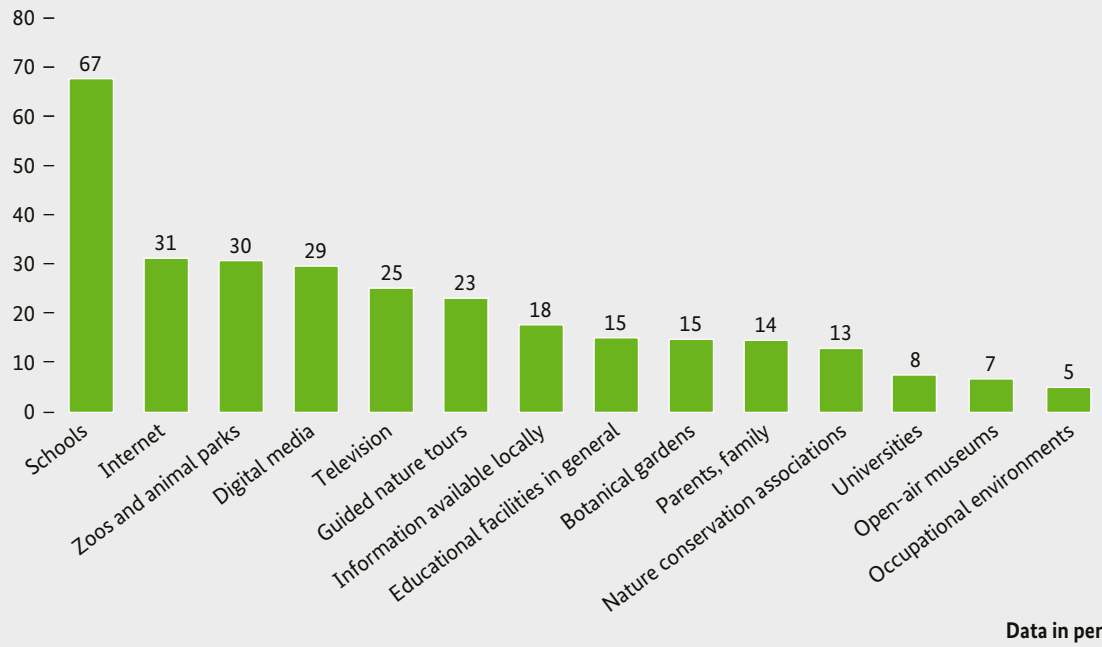
Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

ties (eight percent), open-air museums (seven percent), and occupational environments (five percent) were least often mentioned among the three most important places, and certainly play a minor role in the lifeworlds of young people.

There are very few sociodemographic differences: Schools are primarily mentioned by girls (72 percent) and by better educated young people (72 percent) among the three most important places for learning. By contrast, universities and occupational environments

Figure 17: Places for learning about species diversity

How, in your opinion, should more knowledge about species diversity be conveyed? Please select three options from the following list which, in your opinion, you feel should convey more knowledge about species diversity.



are mentioned most often by young people with a lower level of formal education (16 percent and ten percent respectively).

There are also hardly any findings of note when looking at young people's lifeworlds: Among all lifeworlds, the occupational environment is most often chosen as one of the three most important places for learning by those in the Precarious milieu (ten percent). Parents and family as well as nature conservation associations are mentioned more often than average by Expeditives (eight percent and six percent respectively), while universities are rarely mentioned by Postmaterialists (two percent).

In assessing these findings, it can be conjectured that the young people surveyed describe their daily lifeworld and educational surroundings here, which is why school is in prime position and university is ranked lower with eight percent. The relatively high values for Internet and digital media also speak in favour of this speculation. Taking this argument further, the relatively minor role of parents and family is not especially surprising in the age group surveyed here (14 to 17-year-olds), as parents play a greater role in early childhood experiences of nature than in puberty, during which phase children distance themselves from their parents.

The fact that school ranks top as a place for communicating more species knowledge can certainly be interpreted as a responsibility and task for the future from a nature education perspective. Young people feel that schools should do more to improve knowledge of species diversity. Among other things, school can be a place for promoting a holistic experience of nature (see Pohl 2006). This includes the complementary role of digital media, which are becoming ever more important in day-to-day life in the course of digitalisation.

6 Protected areas – oases for species diversity and climate protection

Protected areas are one of the most important instruments of nature conservation and landscape conservation, and are of great importance for the conservation of species and their habitats. The different protected areas can vary in terms of their size, conservation purpose and objectives, and the usage restrictions to be adopted as a result. The most important protected area categories are: Nature reserves, national parks, biosphere reserves, landscape reserves, and national parks as well as protected areas according to Natura 2000.

Large protected areas such as biosphere reserves, national parks, and nature parks are large, scenic, and natural landscapes that are also suitable for recreation. Biosphere reserves and nature parks in particular not only have the objective of protecting biodiversity, but also of sustainable tourism and sustainable regional development.

German national parks and biosphere reserves alone attract over 100 million visitors to Germany each year. In generally peripheral, rural regions, they have a positive economic effect, generating around six million euros of gross revenue per year and also safeguarding local jobs.

In all regions, however, the negative impact on nature and the landscape associated with the desired visitor numbers must be minimised. Visitor guidance is crucial here (see Porzelt 2019). (Large) protected areas are attractive regions for local recreation and tourism. Popular activities in protected areas include hiking, cycling, canoeing or kayaking, mountain biking, barging, motor boating, sailing, and nature excursions. Digital offerings are also being used increasingly – both for the travel preparation and information phase and for sharing experiences (photos, reviews, etc.). This is an area in which young people are particularly digitally active (see BTE 2018).

The designation of new large protected areas, an increase in their attractiveness, and improved marketing are associated not only with hopes for tourism, but also for nature education. Some even expect a substantial contribution towards reducing the alienation of young people from nature – i.e. what Louv (2008) referred to as the "Nature Deficit Disorder" (see also Schamel 2019). However, the attitudes of young people towards protected areas are open to question.

In light of this, a nationwide, representative survey of the attitudes of young people towards protected areas was carried out for the first time in the form of the 2020 Youth Nature Awareness Study. It asked what young people understand by protected areas, which categories of protected areas they are familiar with, how often they specifically seek out protected areas, what they expect from protected areas (objectives and tasks), and to what extent they are interested in finding out more about protected areas.

6.1 Associations with protected areas

To begin with, the young people were asked to state their associations with the subject of protected areas. They were asked to list as many terms as spontaneously came to mind.

Most frequently, they associated protected areas with landscape and nature.

For 52 percent of young people, protected areas are most frequently associated with "landscape/nature". In particular, the terms "nature/environment" (21 percent) and "woods/forests" (20 percent) were mentioned. The term "habitat/biosphere/biotope" (seven percent) was also frequently mentioned. Fewer people mentioned fenced or blocked off areas (three percent), untouched nature (three percent), natural areas (three percent), marshes/moors (two percent), green spaces (two percent), landscape in general (two percent), beautiful, clean, or healthy landscape (two percent), parks/green areas/gardens (two percent), and jungle/pristine forest/rainforest (two percent). The wild/wilderness, mountains/Alps, undeveloped areas, the ecosystem, and bird nesting sites/breeding grounds were also occasionally mentioned (one percent each). The description "big/open" was also used (one percent).[13]

For 36 percent of young people, a variety of protected area categories come to mind. The term "nature reserves" cropped up most frequently (17 percent). In addition, national parks (seven percent), nature parks (five percent), water protection areas (four percent), reserves (three percent), monuments/natural monuments (three percent), wildlife reserves (two percent), and bird sanctuaries (two percent) were listed. Other categories of protected areas, such as landscape reserves, biosphere reserves, marine conservation areas, as well as unlisted categories such as botanical reserves and forest reserves were listed less frequently (one percent each). The most frequently mentioned names of specific protected areas

were the Harz Mountains, the Eifel region, and the Bavarian Forest (in total six percent).

The protective purposes of nature conservation were mentioned just as frequently as the different protected area categories (35 percent). In addition to environmental protection/nature conservation (14 percent) and animal conservation (ten percent) in general, young people also think specifically about the protection of species (six percent), plants (two percent), landscape (two percent), bodies of water (two percent), birds (one percent), habitats (one percent), and/or the climate (one percent). Ten percent refer to the need to protect such areas.

The category "animals/plants/living beings" ranks fourth among the most frequent responses (34 percent). Above all, the general terms "animals" (25 percent) and/or "plants" (ten percent) were named. However, young people often think specifically of trees (four percent), birds (three percent), wild animals such as wolves or deer (two percent), and/or insects (one percent). "Rare/endangered animals", "rare/endangered plants", and/or "animal diversity" were mentioned by two percent of respondents in each case.

Young people also associate protected areas with the endangerment of nature and the environment.

For twelve percent of the respondents, the destruction of nature and the environment came to mind. Endangered species (three percent), climate change (two percent), environmental pollution (one percent), deforestation (one percent), exhaust gases (one percent), and rubbish/waste/littering (one percent) were listed in this category. Three percent spontaneously thought of the term "endangerment".

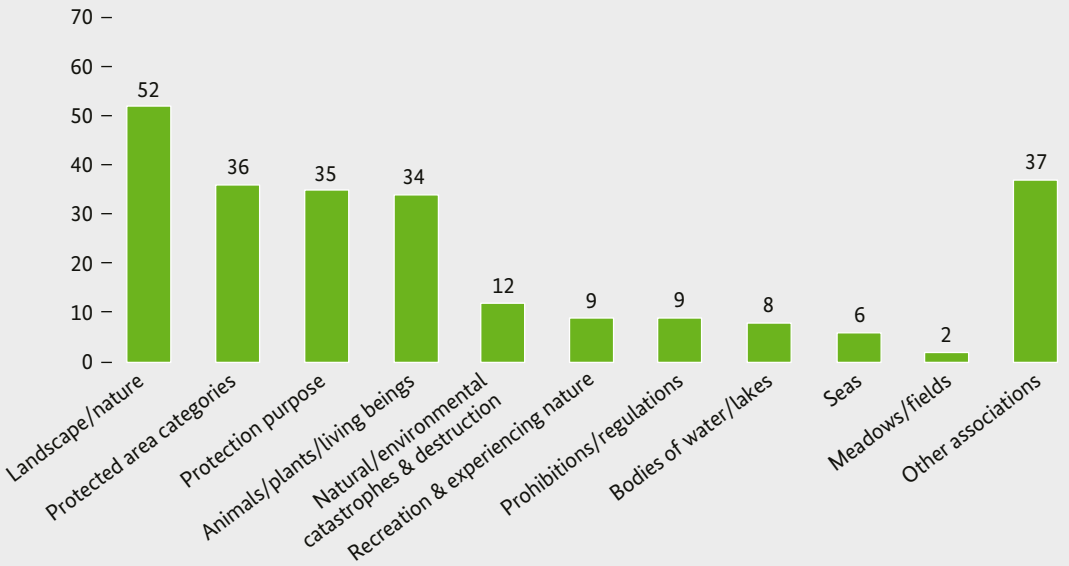
Nine percent of respondents associate protected areas with recreation and leisure time. They mentioned recreational places (zoos/animal parks/wildlife parks/bird parks: two percent) and/or leisure activities (hiking/going for a walk: one percent). They also associate protected areas with "peace" (four percent), relaxation (one percent), freedom (one percent), good/fresh/clean/healthy air (one percent), and regeneration (one percent).

A further nine percent also mentioned prohibitions or regulations. Here, terms such as "rules/prohibitions" (six percent), "security measures/under surveillance" (two percent), and "signs" (one percent) cropped up.

Eight percent of the terms listed relate to "bodies of water/lakes". Usually this means lakes (five percent), but water/bodies of water (two percent), rivers (one percent), and ponds/pools (one percent) are also named in this category. A total of six percent of respondents said "seas". Young people primarily associate this with oceans (three percent), the Wadden Sea (two percent), and the beach (one percent). "Meadows" and "fields" are each mentioned relatively rarely with a total of two percent.

Figure 18: Associations with protected areas

What comes to mind when you think about protected areas? Please list as many terms as you can think of.



Data in percent

Overall, it is interesting that young people do not primarily associate the subject of protected areas with prohibitions and regulations, but with landscapes or parts of nature that must be protected. The young people referred not only to the protective purposes of nature conservation, but also spontaneously to the endangerment of nature and the environment.

6.2 Knowledge and targeted visiting of protected areas

Before the young people were asked about their knowledge of different protected area categories, they were asked to read a brief definition of protected areas: "Protected areas are designated areas with the aim of preserving and developing nature and the landscape."

Three out of four young people have never heard of Natura 2000 before.

Seventy-five percent of young people are unfamiliar with the term "Natura 2000", while 22 percent have heard of it but don't know what it means. This leaves just three percent who have not only heard of "Natura 2000", but also know what it means (see Figure 19).

Biosphere reserves are also not very well known. Fourteen percent of the respondents claimed to understand the term "biosphere reserve/area" and a further 42 percent said they had at least heard of it. By contrast, 44 percent had never come across the term "biosphere reserve/area" before.

The terms "nature reserve", "national park", and "nature park" were much better known. Eighty-seven percent of respondents stated that they not only knew the term "nature reserve" but also understood what it meant. For the terms "national park" and "nature park", 70 percent and 54 percent respectively claimed to understand what the terms mean.

The sociodemographic findings show that the term "nature park" is more familiar to girls than to boys (61 percent compared to 47 percent). In addition, above-average numbers of young people with a high level of formal education stated that they understood the terms "nature reserve" and "national park" (91 percent and 77 percent respectively).

In the comparison of lifeworlds, it is the Adaptive Pragmatists who are particularly interested in information and claim to understand what the term "nature reserve" means. The term is less familiar in the less well-educated lifeworlds of the Materialistic Escapists (79 percent) and the Precarious (74 percent). Below-average numbers of Materialistic Escapists express an understanding of the terms "national park" and "biosphere reserve/area" (56 percent and eight percent respectively).

Figure 19: Knowledge of protected areas

Please specify whether you have heard these terms before.

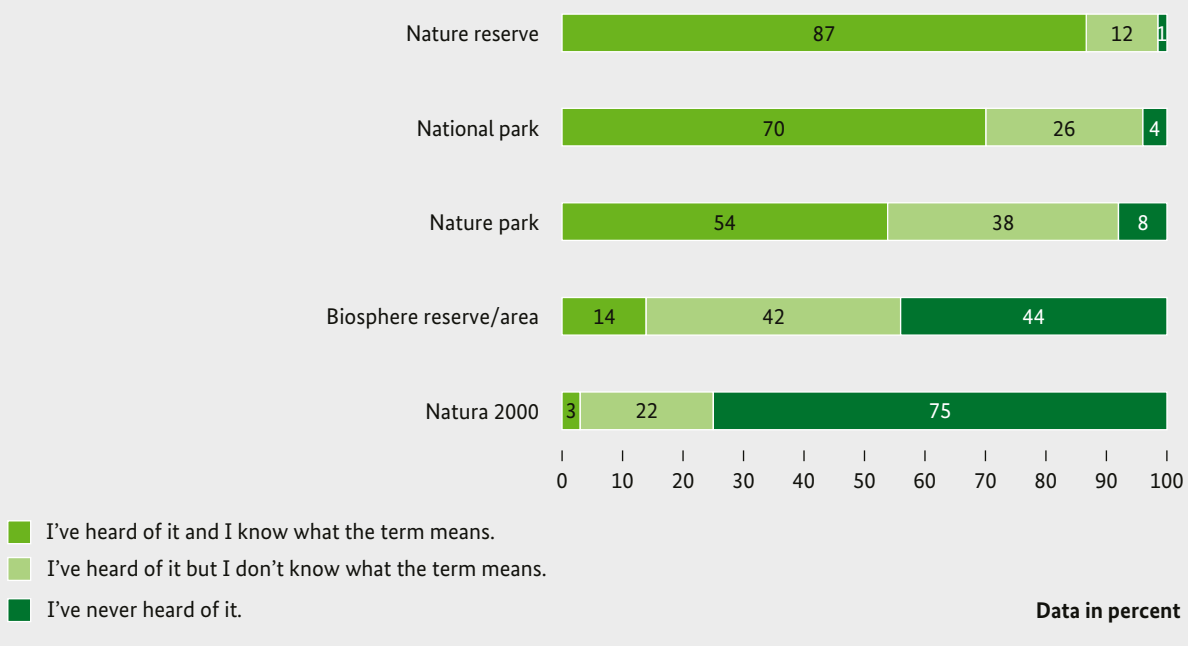
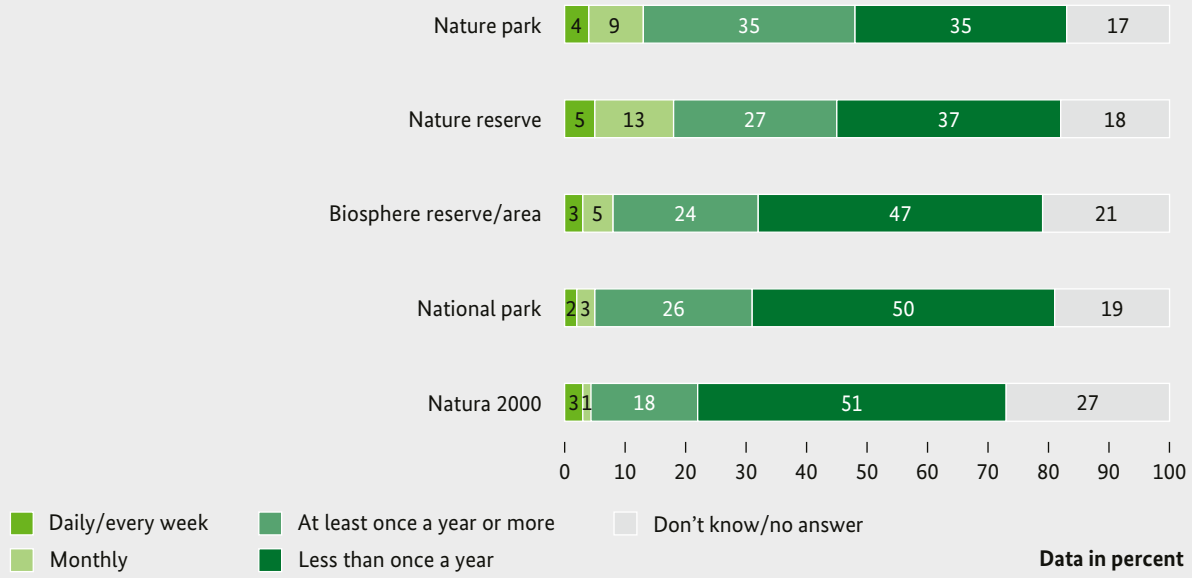


Figure 20: Targeted visiting of protected areas

How often do you purposefully visit the following protected areas? *



* *Only respondents who answered, "I've heard of it and I know what the term means" for the respective protected area are asked this question.*

Those young people who claimed not only to be familiar with the terms "nature reserve", "national park", "nature park", and/or "biosphere reserve" but also to understand what they mean were asked to indicate how often they specifically visit protected areas (see Figure 20).[14]

Nature parks and nature reserves are visited most frequently.

Forty-eight percent of young people surveyed deliberately visit a nature park at least once a year, while nine percent go monthly and four percent even visit a nature park at least once a week. Nature reserves are visited by 45 percent of respondents at least once a year. Thirteen percent visit a nature reserve monthly and five percent at least once a week.

Biosphere reserves are visited by 32 percent of respondents at least once a year (monthly: five percent, weekly: three percent). Thirty-one percent visit a national park at least once a year (monthly: three percent, weekly: two percent).

There are barely any noticeable sociodemographic differences. It is only worth noting that young people with a high level of formal education visit nature reserves more frequently than young people with average and low levels of formal education (at least once a year: low education level: 31 percent, medium education level: 39 percent, high education level: 49 percent). The sociocultural analysis also shows: National parks are visited least often by members of the Materialistic Escapist lifeworld, who are less interested nature (at least once a year: 31 percent compared to 48 percent on average in the youth population).

6.3 Objectives and tasks of protected areas

To find out what young people consider to be the primary tasks of protected areas, the respondents were shown a list of twelve possible conservation objectives, from which they were asked to name the three most important, in their opinion.

For three out of four young people, protecting the diversity of plants and animals is a key task of protected areas.

Seventy-four percent of the respondents listed the conservation of species diversity, making it by far the most frequently mentioned of the three most important objectives of protected areas (see Figure 21). "Combating climate change" (40 percent), "allowing undisturbed landscape development" (35 percent), and "allowing wilderness" (32 percent) were the second, third, and fourth most frequently mentioned tasks. "Preserving beautiful landscapes" and "safeguarding the basis for

human existence" were also selected as particularly important objectives at 27 percent each. "Preserving homeland" and "ensuring the protective function of the landscape" were each named by 15 percent of respondents. All other protective functions were deemed to be particularly important by less than ten percent of the young people surveyed.

In the sociodemographic analysis, differences in the level of education are clear: Above-average numbers of young people with a high level of formal education stated that the aspects of "ensuring the species diversity of animals and plants" (83 percent compared to 74 percent) and "allowing undisturbed landscape development" (41 percent compared to 35 percent) were among the three most important objectives of protected areas. By contrast, above-average numbers of young people with a low level of formal education named the objectives of "preserving homeland" (23 percent compared to 15 percent) and "supporting education and science" (14 percent compared to eight percent). It is also clear that: More girls than boys count the aspect of "ensuring the species diversity of animals and plants" among the top three objectives (82 percent compared to 67 percent). On the other hand, more boys than girls selected the aspect of "enabling recreation" (twelve percent compared to six percent). The size of the place the young people come from is not significant. But it is worth noting that the aspect of "promoting ecological agriculture" is listed especially rarely as an important objective by young people who live in villages and small towns (less than 20,000 inhabitants) (two percent compared to an average nine percent of respondents).

Taking the young people's lifeworlds into consideration, there are only a few differences: Below-average numbers of Expeditives, who consider themselves to be urbane, cosmopolitan "hipsters", listed the aspects of "preserving homeland" (nine percent compared to 15 percent) and "promoting ecological agriculture" (five percent compared to nine percent) as being particularly important. By contrast, the number of Expeditives to

Figure 21: Objectives and tasks of protected areas

What, in your opinion, are the most important objectives and tasks of protected areas? Please select three possibilities from the following selection.

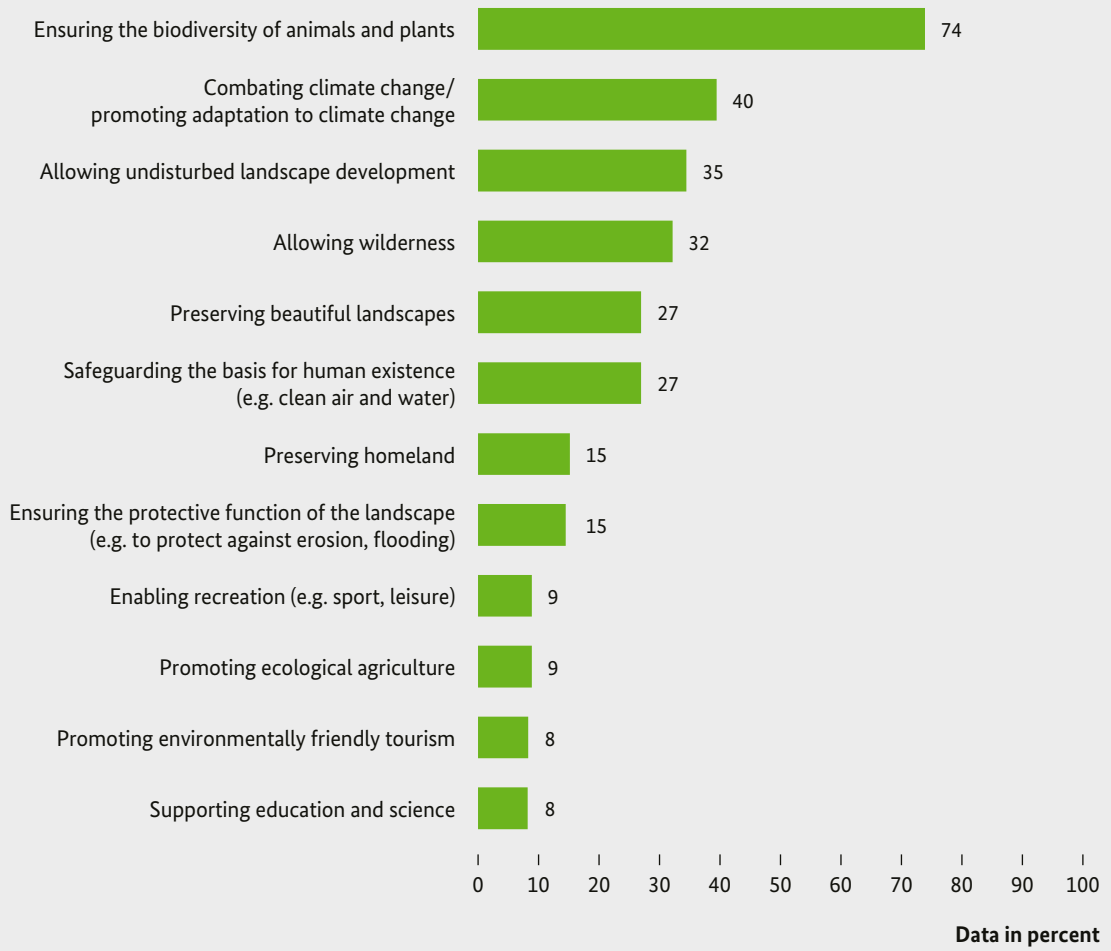
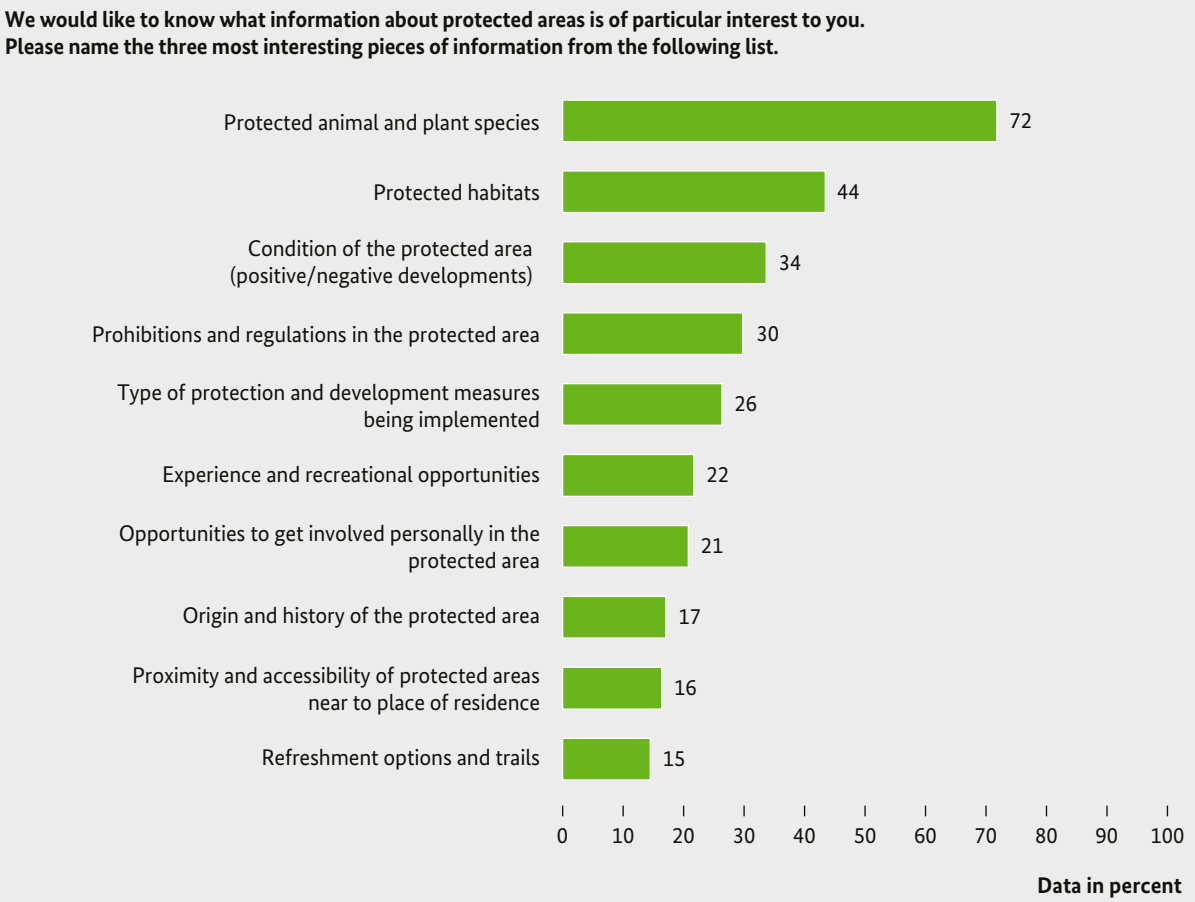


Figure 22: Information interests about protected areas



list the conservation of species diversity as one of the three most important objectives of protected areas was above average (82 percent compared to 74 percent). The leisure-focused Materialistic Escapists viewed the conservation of species diversity less often as a central task than all other lifeworlds (58 percent compared to 74 percent). Young people from the Precarious milieu, who often feel disadvantaged by society, are more likely than average to count preserving homeland (27 percent compared to 15 percent) and promoting environmentally-friendly tourism (17 percent compared to eight percent) among the top three objectives.

6.4 Information interests and preferences for obtaining information

After the young people selected what they considered to be the three most important tasks of protected areas, they were asked (1) which information about protected areas they were particularly interested in and (2) how they would prefer to receive information about protected areas. Once again, a selection of responses was offered from which the young people were asked to choose three options.

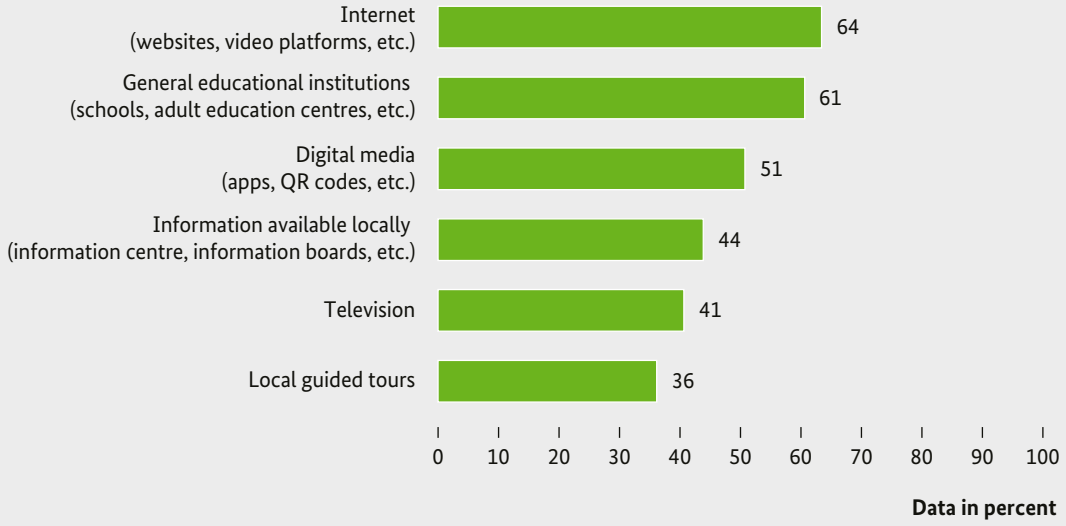
Over 70 percent are interested in information about protected plant and animal species.

The respondents showed the greatest interest in information about protected animal and plant species (see Figure 22): 72 percent of young people said they were particularly interested in this. With 44 percent of responses, information about protected habitats came second out of the three most interesting types of information. Thirty-four percent of respondents were particularly interested in the condition of the protected area while 30 percent wanted to know more about prohibitions and regulations in the protected areas.

For a good quarter of respondents, information about the type of conservation and development measures implemented was one of the three most important types of information. Twenty-two percent found it most important to have information about experience and recreational opportunities, while 15 percent were (also) interested in refreshment options and trails. Twenty-one percent counted opportunities to get personally involved in the protected area among the three most important types of information, while 17 percent of young people were particularly interested in

Figure 23: Preferences for obtaining information

We would like to know how you would like to be informed about protected areas. Please select three possibilities from the following selection.



information about the creation and history of the protected area. A similar number of respondents wanted information about the proximity and accessibility of protected areas near to a place of residence (16 percent).

The sociodemographic analysis only reveals a few differences in the response behaviour: More girls than boys counted information about protected animal and plant species (78 percent compared to 67 percent) among the three most interesting types of information. The same applies to information about opportunities to get personally involved in the protected area (26 percent compared to 16 percent). The results also show that young people who live in villages or small towns (less than 20,000 inhabitants) showed above-average interest in the creation and history of the protected area (26 percent compared to 17 percent). On the other hand, they are less interested in the type of conservation and development measures being implemented (17 percent compared to 26 percent).

There are also few differences between the different lifeworlds. It is worth mentioning that, of all lifeworlds, the Precarious young people who took part were most interested in the opportunities to get involved in protected areas (30 percent compared to 21 percent on average). Precarious young people were less interested in protected animal and plant species than average (60 percent compared to 72 percent).

Two-thirds would like Internet offerings.

Sixty-four percent of the young people surveyed include Internet offerings (such as websites or video platforms) as one of the three most important ways of obtaining information about protected areas. General educational institutions were the second most popular source of information (61 percent). Digital media, such as apps or QR codes, came third in the list of the most important information channels (51 percent). This was followed by on-site information offerings (44 percent) and television (41 percent). For 36 percent of respondents, local guided tours were also among the most important sources of information (see Figure 23).

Young people who live in villages or small towns (less than 20,000 inhabitants) were particularly interested in Internet offerings (75 percent compared to 64 percent on average). Young people with a high level of education were more likely to count general educational institutions (66 percent compared to 61 percent) in the top three information possibilities, and more girls (68 percent) than boys (54 percent). Television is preferred by young people with low and average levels of formal education (49 percent each), but less so by young people with a high level of formal education (35 percent).

When comparing the lifeworlds, it is above all the well-educated Postmaterialist young people who list educational institutions such as schools or adult education centres as their preferred source of information (80 percent). The Materialistic Escapists are significantly more reserved here (49 percent). Above-average numbers of young people from this lifeworld count television among the top three information sources (51 percent), while the social mainstream of the youth population – the Adaptive Pragmatists – are much less likely to count the television as a preferred information source (30 percent).

7 Responsibility for and commitment to nature – achieving something together

It's true that nature conservation is a responsibility of the state, but it cannot succeed without civic involvement and broad-based social support. The types of support and acceptance of responsibility can be very varied and range from active, permanent membership of a nature conservation association to donations to a specific nature conservation project, signing a petition, or participating in a demonstration. And last but not least, behaving in an environmentally friendly manner every day.

For years, there have been complaints that young people are not very interested in politics in general and are also not very actively involved in specific political areas. One indicator for this is the lower voter turnout among first-time voters, while another indicator is that young people show little interest in getting involved in political parties. Large, representative youth studies show that young people are particularly distrustful of established politics (see Gille 2018, Schneekloth et al. 2017). But youth participation in traditional civic organisations, associations, and clubs is also declining. Many are confronted with the problem of an ageing population in their structures and have major concerns about finding young people to continue their work (see Alscher 2017).

Considering the growing pressure for success at school and at work, as well as the general lack of time, young people today give a lot of consideration to how they want to spend their precious free time (see BMU 2018). If they get involved in something, they expect it to have a relatable meaning and to have the feeling of actually achieving something through their involvement. But they also want getting involved to be a fun and positive experience. Who young people can meet at an activity is important – can they make interesting contacts or make new friends? The sense of actually being valued by an organisation, being treated with respect and on an equal footing, is also very important. In addition to the political content, however, emotional and aesthetic issues are also important (see Farin 2020).

Despite this inner distance from the political system and traditional civic organisations, however, young people are not apolitical. On the contrary: They want to be involved, but direct their efforts towards non-party, selective, subject-specific, or other informal campaigns, which are more expressive and protest-oriented and can also take place on the Internet or via social media (see Gille 2018).

Studies from recent years indicate that young people are once again becoming more interested in politics – away from parties and parliaments. Whereas 30 percent indicated an interest in politics in 2002, this had already risen to 41 percent in 2019 (see Albert et al. 2019). As the level of education rises, so too does political interest. And young men are often more interested in politics than young women.

The relationship between young people and political and civic involvement is complex and cannot be reduced to a common denominator. This is reason enough to investigate this complex field with regard to nature conservation too. Young people in particular find environmental and nature issues important. This can be seen not only in the support of movements such as "Fridays for Future", "Extinction Rebellion", or "Ende Gelände". Membership of large nature conservation associations is increasing, including in their youth organisations. Nature conservation education, which is focused on the interests and lifeworlds of young people, is showing signs of success (see Hesebeck 2018). At the same time, we know that the young people's involvement in environmental and nature issues is particularly high wherever it is low-threshold and not very time-intensive (see BMU 2018).

In this chapter, we ask how important young people consider commitment to nature conservation to be. We are interested in finding out to whom young people primarily attribute responsibility, how they rate their own effectiveness both as a generation and as individuals, what types of public and private involvement they think are meaningful and even take part in themselves. This chapter therefore aims to use the example of nature conservation to shed more light on the above-mentioned complex conflict situation between distance from classical politics on the one hand and the apparent recent increase in involvement in environmental protection and nature conservation on the other hand.

7.1 Attribution of responsibility for the protection of nature in Germany

In order to investigate who young people primarily hold accountable for nature conservation in Germany, they were asked who, in their opinion, should accept more responsibility for it in future.

Young people first and foremost hold politics responsible for nature conservation.

Sixty-one percent of young people "agree strongly" that politics should accept more responsibility for nature conservation in future, while a further 20 percent "agree somewhat" with this opinion (see Figure 24). Around every second young person unreservedly holds environmental and nature conservation organisations as well as the agriculture and forestry sector responsible ("agree strongly": 56 percent and 49 percent respectively, "agree somewhat": 28 percent and 33 percent respectively). Almost half of young people also think citizens are responsible ("agree strongly": 49 percent, "agree somewhat": 31 percent). Forty-five percent unreservedly believe that industry and trade should take more responsibility in future, while 28 percent agree "somewhat". Thirty-eight percent "agree strongly" and 27 percent "agree somewhat" that tourism is responsible. Young people attribute less responsibility to churches and religious communities ("agree strongly": 16 percent, "agree somewhat": 21 percent).

The attribution of more responsibility for nature conservation is dependent on the educational background of the young people: With the exception of churches and religious communities, all social groups, organisations, and institutions mentioned in the survey were attributed even greater responsibility by young people with a high level of formal education than by young people with a low level of formal education. For example, 29 percent of young people with a low level of formal education "strongly" agree that industry and trade should take more responsibility, while 51 percent of the group with a high level of formal education said the same. The respondents' gender was only occasionally relevant: More girls than boys unreservedly agree that citizens and the tourism sector should accept greater responsibility for nature conservation in future (see Table 4).

Figure 24: Attribution of responsibility for the protection of nature

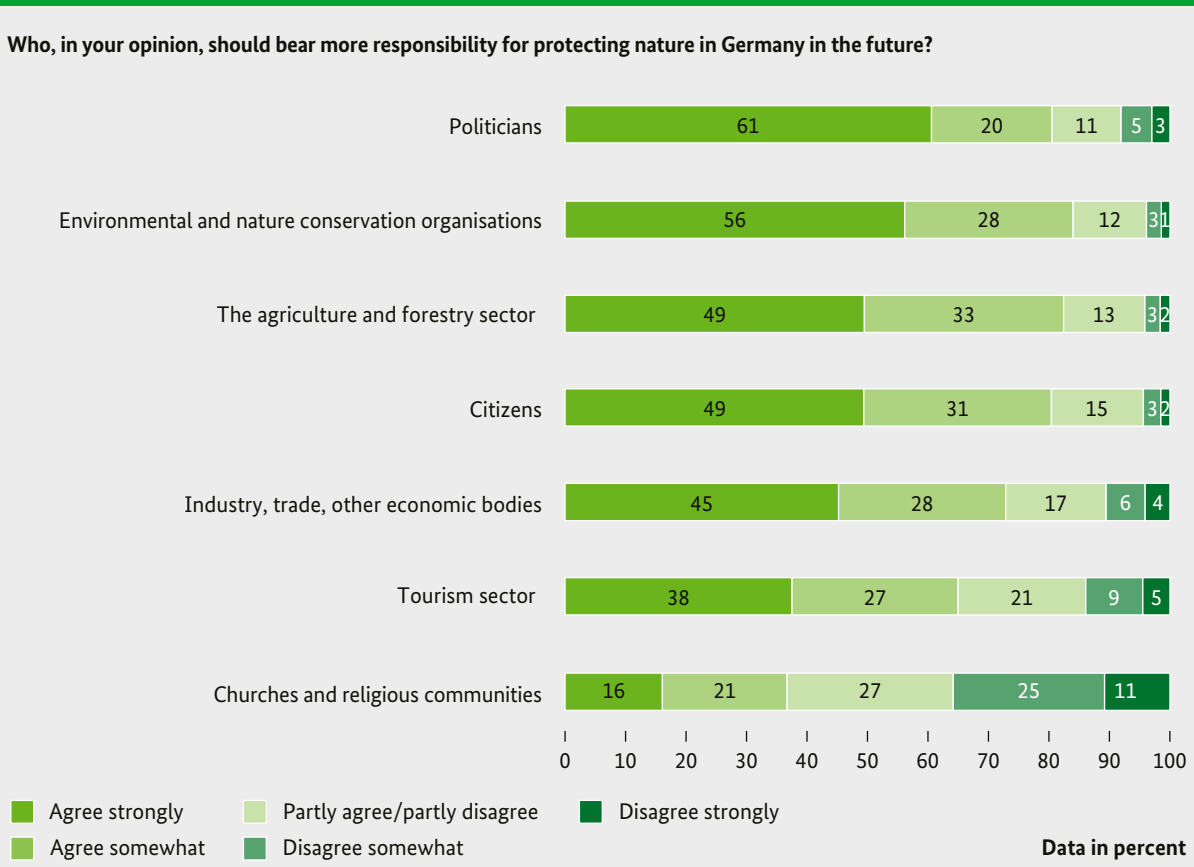


Table 4: Attribution of responsibility for the protection of nature according to gender and educational level

Who, in your opinion, should bear more responsibility for protecting nature in Germany in the future?

Response category: **Agree strongly** Data in percent	Average	Gender		Educational level		
	Ø	M	F	Low	Medium	High
Politicians	61	57	64	42	59	66
Environmental and nature conservation organisations	56	56	56	47	58	58
The agriculture and forestry sector	49	46	54	38	47	54
Citizens	49	42	57	36	46	55
Industry, trade, other economic bodies	45	42	50	29	44	51
Tourism sector	38	32	43	22	37	42
Churches and religious communities	16	17	15	18	17	15

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

Looking at the lifeworlds, we see clear differences in the response behaviour of the young people: The biggest expectations with regard to assuming greater responsibility for nature conservation come from the ranks of the sustainability-oriented Postmaterialists and the particularly adaptive and ready-to-compromise Adaptive Pragmatists. In both of these lifeworlds, the young people have above-averagely high expectations of the state as well as of companies, civil organisations, and citizens (excluding churches and religious communities). For example, 88 percent of Postmaterialists and 76 percent of Adaptive Pragmatists unreservedly agree that politics should accept more responsibility for nature conservation in Germany in future (average: 61 percent). The opposite is true of Materialistic Escapists and the socially, culturally, and educationally disadvantaged Precarious young people. Their demands for greater acceptance of responsibility are comparatively reserved (see Table 5).

7.2 Collective and personal perceptions of effectiveness

This section looks at the question of how effective we judge our own actions to be with regard to nature conservation. A distinction is made between collective (through joint efforts) and personal (individual) effectiveness. The background to this is the obvious assumption that personal involvement is less likely the less we believe that it will have an effect on others or the situation as a whole.

The majority of young people agree that they personally can achieve something to protect nature on Earth.

At 84 percent, there was wide agreement (both approval levels) with the statement that humankind can work together to achieve something to protect nature on Earth. A majority of 54 percent of the young generation considers itself politically (somewhat) unable to stop the destruction of nature on its own (see Figure 25). Nevertheless, 47 percent share the opinion that joint demonstrations by the younger generation can achieve something in terms of nature conservation (both approval levels).

The broad agreement concerning collective effectiveness does not affect the personal perception of effectiveness: 53 percent of young people are more or less convinced that they themselves can do something to protect nature on Earth (both approval levels), 52 percent believe they can also motivate others with regard to nature conservation through their own example. Thirty-nine percent disagree with the statement that personal involvement often seems ineffective, to the extent that they make no effort to achieve anything, while only 27 percent agree (somewhat).

The lower the level of formal education, the weaker the perception of self-efficacy.

Girls were slightly more likely than boys to agree that we as humankind can work together to achieve something to protect nature on Earth (both approval levels: 89 percent and 80 percent respectively). Differences

in education are much more striking than differences between genders (see Table 6): Young people with a high level of formal education were most frequently of the opinion that joint efforts by all people can make a difference to nature conservation (both approval levels: low education level: 73 percent, medium education level: 81 percent, high education level: 90 percent). The same applies to the statement that joint demonstrations by young people could do something for nature conservation (low education level: 36 percent, medium education level: 47 percent, high education level: 50 percent). However, young people with a high level of formal education are also slightly more frequently of the view than those with a low level of formal education that the young generation alone would be (somewhat) unable to stop the destruction of nature through politics (low education level: 44 percent, medium education level: 52 percent, high education level: 59 percent). It is also worth noting that the lower the level of formal education, the weaker the perception of self-efficacy. Thirty-six percent of young people with a low level of formal education believe they themselves can personally achieve something for nature conservation (both approval levels), rising to 46 percent in the group with a medium level of formal education and even 61 percent in the group with a high level of formal education.

Postmaterialist young people are most frequently of the opinion that their own generation would not be able to stop the destruction of nature through politics alone.

The Adaptive Pragmatists, who are particularly adaptive and focused on what is fundamentally feasible, as well as the conscientious Conservative Mainstream most frequently agree with the statement that we as humankind can work together to achieve something to protect nature on Earth (both approval levels: 92 percent and 97 percent respectively). By contrast, the approval levels of the Precarious, whose everyday life is characterised by the struggle for normality and keeping

Figure 25: Collective and personal effectiveness

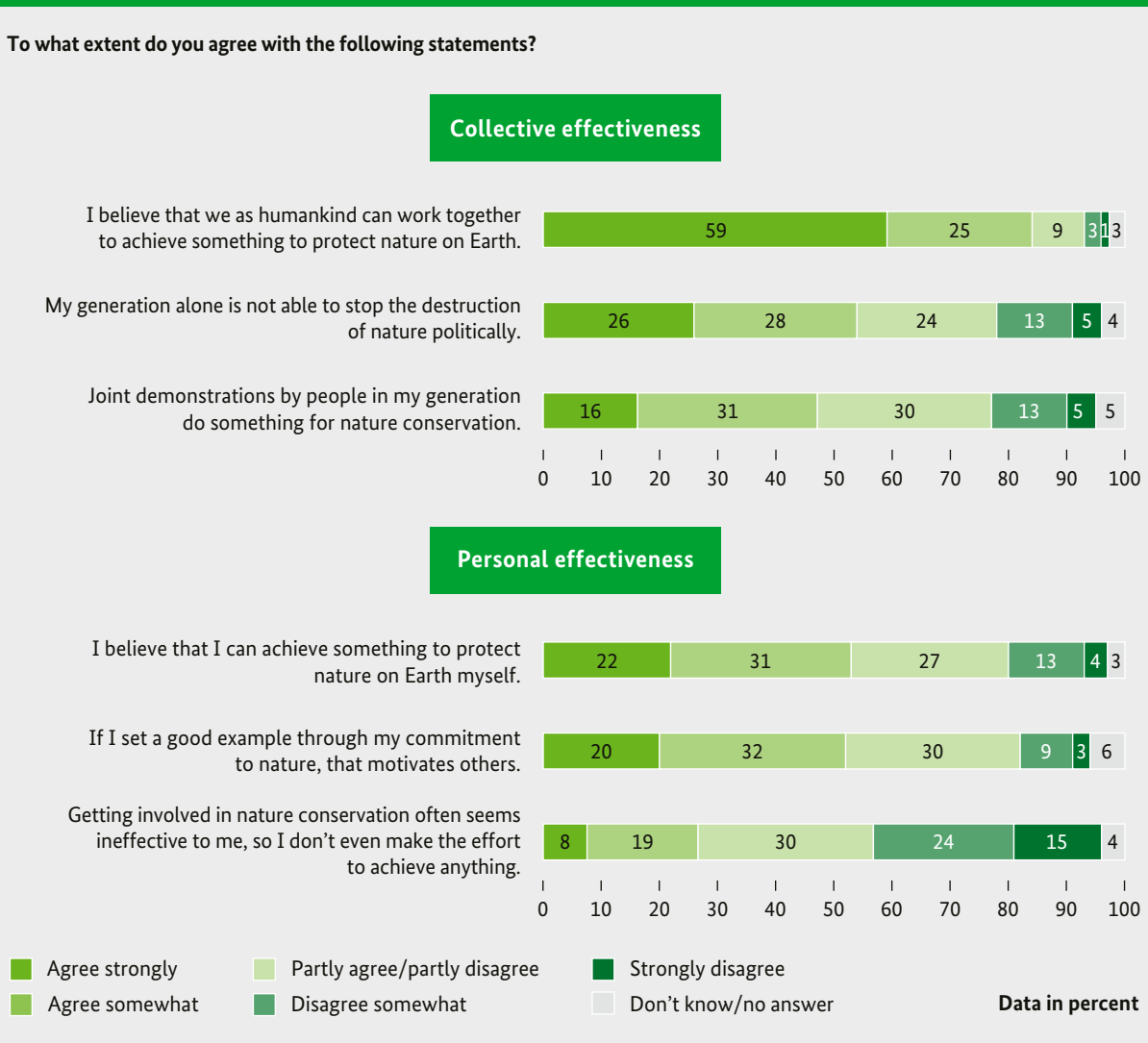


Table 5: Attribution of responsibility for the protection of nature according to young people's lifeworlds

Who, in your opinion, should bear more responsibility for protecting nature in Germany in the future?

Response category: Agree strongly Data in percent	Average	Conservative Mainstream	Postmaterialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
Politicians	61	61	88	76	57	58	39	45
Environmental and nature conservation organisations	56	62	69	64	60	53	39	41
The agriculture and forestry sector	49	49	62	62	51	47	36	39
Citizens	49	58	75	62	41	48	30	35
Industry, trade, other economic bodies	45	47	67	59	39	46	25	39
Tourism sector	38	40	54	46	32	36	24	36
Churches and religious communities	16	14	22	21	13	19	10	12

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

pace, and the Materialistic Escapists, who are distanced from nature, are significantly lower (70 percent and 59 percent respectively). Interestingly, above-average numbers of Postmaterialist young people, who are focused on nature conservation, are of the opinion that their own generation would not be able to stop the destruction of nature through politics alone (both approval levels: 70 percent, average: 54 percent). This can be read as an expression of greater realism among these young people, or at the very least as an indication that their otherwise strong perceptions of effectiveness are not based on an overestimation of collective potential influence. Sixty-four percent of Postmaterialists – and therefore above-average numbers of them – are of the view that joint demonstrations by the young generation can achieve something for nature conservation (average: 48 percent). Above-average numbers of Adaptive Pragmatists also agree with this statement (57

Table 6: Collective and personal effectiveness according to gender and level of education

To what extent do you agree with the following statements?

Response category: Agree strongly/somewhat Data in percent	Average	Gender		Educational level		
	Ø	M	F	Low	Medium	High
Collective effectiveness						
I believe that we as humankind can work together to achieve something to protect nature on Earth.	84	80	89	73	81	90
My generation alone is not able to stop the destruction of nature politically.	54	53	55	44	52	59
Large demonstrations by people in my generation do something for nature conservation.	48	49	46	36	47	50
Personal effectiveness						
I believe that I can achieve something to protect nature on Earth myself.	53	50	55	36	46	61
If I set a good example through my commitment to nature, it will also motivate others.	52	48	55	39	48	58
Getting involved in nature conservation often seems ineffective to me, so I don't even make the effort to achieve anything.	27	29	24	29	30	25

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

percent) while Materialistic Escapists are significantly more pessimistic (25 percent).

The perception of personal effectiveness is strongest among Postmaterialists and the Adaptive Pragmatists. The Precarious and Materialistic Escapists are much more cautious in their assessment of their own effectiveness (see Table 7). For example, two-thirds of Postmaterialists and Adaptive Pragmatists are "strongly" or at least "somewhat" convinced that they themselves can achieve something for nature conservation on Earth. This translates to 41 percent of the Precarious and just 27 percent of Materialistic Escapists.

7.3 Knowledge of, participation in, and opinion of youth movements

Following on from the questions on collective and personal perceptions of effectiveness, the young people were asked to assess the commitment of their own generation to nature conservation. They were also asked which environmental protection and nature conservation movements they were familiar with, whether they take part (or have already taken part) in demonstrations by youth movements, and how they rate the importance of such movements.

Young people are of a split opinion regarding the commitment by their own generation.

Around a third of young people consider the commitment of their own generation to nature conservation to be very strong or quite strong (32 percent), very weak low or quite weak (33 percent), or average (34 percent) (see Figure 26). The gender and age of the young people is of as little relevance in this result as the size of town, although the educational background did have an influence: Formally well-educated young people rate the commitment levels of their generation more highly overall than young people with a low level of formal education ("very" or "quite strong": low education level: 21 percent, medium education level: 23 percent, high education level: 39 percent).

Analysis by lifeworlds also reveals differences in response behaviour: Below-average numbers of the Experimentalists, who focus on fun and their scene, the Precarious, who desire social participation, and the leisure-oriented Materialistic Escapists rate the commitment of their own generation as very or quite strong (Experimentalists: 23 percent, Precarious: 20 percent, Materialistic Escapists: 19 percent, average: 31 percent). The success-oriented networkers – the Expeditives – have a significantly more positive view of commitment ("very/quite strong": 41 percent).

Table 7: Collective and personal effectiveness according to young people's lifeworlds

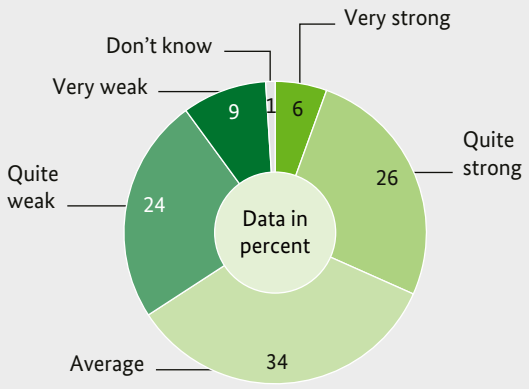
To what extent do you agree with the following statements?

Response category: **Agree strongly/somewhat** Data in percent	Average	Conservative Mainstream	Postmaterialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
Collective effectiveness								
I believe that we as humankind can work together to achieve something to protect nature on Earth.	84	92	90	97	89	85	59	70
My generation alone is not able to stop the destruction of nature politically.	54	47	70	54	55	55	50	56
Large demonstrations by people in my generation do something for nature conservation.	48	48	64	57	52	47	25	39
Personal effectiveness								
I believe that I can achieve something to protect nature on Earth myself.	53	60	66	66	50	54	27	41
If I set a good example through my commitment to nature, it will also motivate others.	52	59	72	65	49	54	27	32
Getting involved in nature conservation often seems ineffective to me, so I don't even make the effort to achieve anything.	27	30	15	19	25	33	35	36

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

Figure 26: Assessment of the commitment by one's own generation

How would you assess the commitment of your generation, that is to say young people of your age, to nature conservation?



Nine out of ten young people are familiar with the Fridays for Future movement.

Of the six environmental and nature conservation movements listed in the survey, the Fridays for Future movement was by far the most well-known (see Figure 27): 93 percent of young people indicated that they had already heard of it. Fifty-nine percent of young people are familiar with the logo of the anti-nuclear power movement "Atomkraft? Nein, danke!".[15] With a familiarity value of 38 percent, "Hambach Forest/Hambi bleibt" came third among the movements mentioned in the survey. "Ende Gelände" (19 percent), "Extinction Rebellion" (16 percent), and "Wir haben es satt!" (twelve percent) are significantly less well known.

The sociodemographic analysis reveals that "Fridays for Future", "Atomkraft? Nein danke!", and "Hambach Forest/Hambi bleibt" are better known by young people with a high level of formal education than by young people with a low level of formal education (see Table 8). In addition, more boys than girls stated that they had already heard of the "Ende Gelände" movement (23 percent and 15 percent respectively).

Furthermore, the comparison of lifeworlds reveals that, for the three most well-known movements, below-average numbers of young people who are particularly interested in consumption – the Materialistic Escapists – stated that they had heard of them before ("Fridays for Future": 81 percent, "Atomkraft? Nein, danke!": 38 percent, "Hambach Forest/Hambi bleibt": 26 percent). It is also worth noting that the "Atomkraft? Nein danke!" logo is particularly well-known among the modern mainstream of young people – the Adaptive Pragmatists – and the well-educated Postmaterialists (70 percent and 71 percent respectively).

Every third young person has already taken part in demonstrations for nature conservation and environmental protection.

Figure 27: Awareness of environmental and nature conservation movements

Have you ever heard of the following movements?

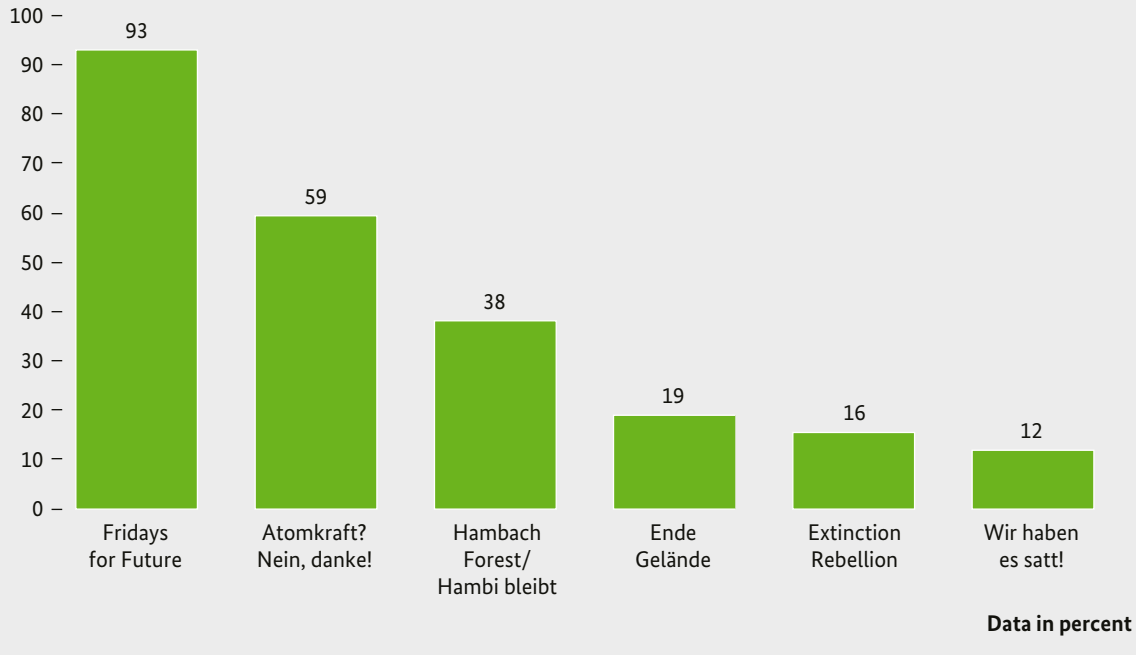


Table 8: Awareness of environmental and nature conservation movements according to gender and educational level

Have you ever heard of the following movements?

Data in percent	Average	Gender		Educational level		
	Ø	M	F	Low	Medium	High
Fridays for Future	93	90	95	87	90	96
Atomkraft? Nein, danke!	59	59	59	45	56	66
Hambach Forest/Hambi bleibt	38	42	34	23	29	46
Ende Gelände	19	23	15	18	16	21
Extinction Rebellion	16	18	13	12	10	19
Wir haben es satt!	12	13	11	12	13	12

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

A third of the young people surveyed said they had already taken part in demonstrations for nature conservation and environmental protection. Sixty-four percent stated that they had not (yet) taken part in any of these demonstrations, and three percent didn't know (see Figure 28). It is primarily young people with a high level of formal education who have already taken to the streets for environmental protection and nature conservation. In this group, 41 percent said they had already taken part in demonstrations, while it was 25 percent in the group with an average level of formal education and 20 percent in the group with a low level of formal education.

A comparison according to lifeworlds shows that it is the Postmaterialists in particular, who have already taken part in demonstrations for nature conservation and environmental protection (49 percent). This is not surprising, as it is the Postmaterialist young people who have a comparatively strong sense of mission – convincing others of their own views is important to them. By contrast, the number of Materialistic Escapists is significantly lower (23 percent).

Two-thirds of young people who have not yet taken part in demonstrations for nature conservation and environmental protection could imagine doing so in future.

Figure 28: Participation in demonstrations for nature and environmental conservation

Have you taken part yourself in demonstrations for nature and environmental conservation, for example Fridays for Future, Ende Gelände, or others?

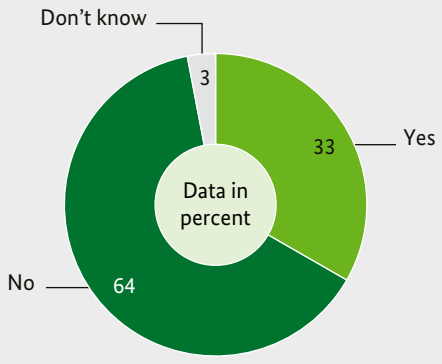


Figure 29: Willingness to take part in demonstrations

Could you imagine taking part in demonstrations?

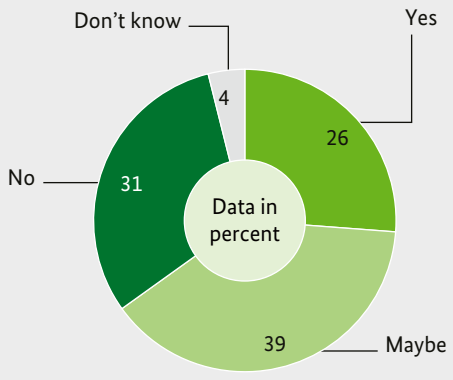
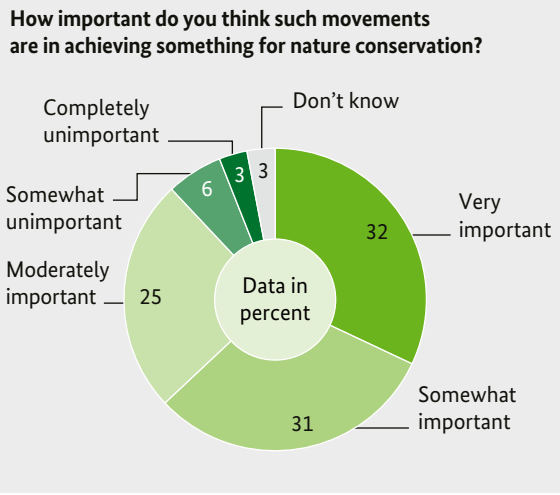


Figure 30: Assessment of the importance of environmental and nature conservation movements



The young people who have not yet taken part in a demonstration were asked if they could imagine doing so in future (see Figure 29): 26 percent said "Yes", 39 percent said "maybe", and 31 percent said "No". There is therefore, in principle, a high mobilisation potential for young people who have not yet taken part in demonstrations for nature conservation and environmental protection. This mobilisation potential is particularly high for the Postmaterialist young people ("yes": 47 percent, "maybe": 34 percent) and for girls ("yes": 32 percent, "maybe": 39 percent) more so than for boys ("yes": 21 percent, "maybe": 39 percent). It is also clear that above-average numbers of young people who live in very small towns (less than 20,000 inhabitants) answered "no" (46 percent, average 31 percent).

Sixty-three percent of young people find environmental protection and nature conservation movements to be important.

In response to the question about the importance of environmental protection and nature conservation movements, 32 percent answered "very important", 31 percent "somewhat important". Twenty-five percent of young people consider such movements to be "moderately important". The answers "somewhat unimportant" (six percent) and "completely unimportant" (three percent) were rare.

Figure 31: Assessment of the importance of environmental and nature conservation movements according to lifeworlds

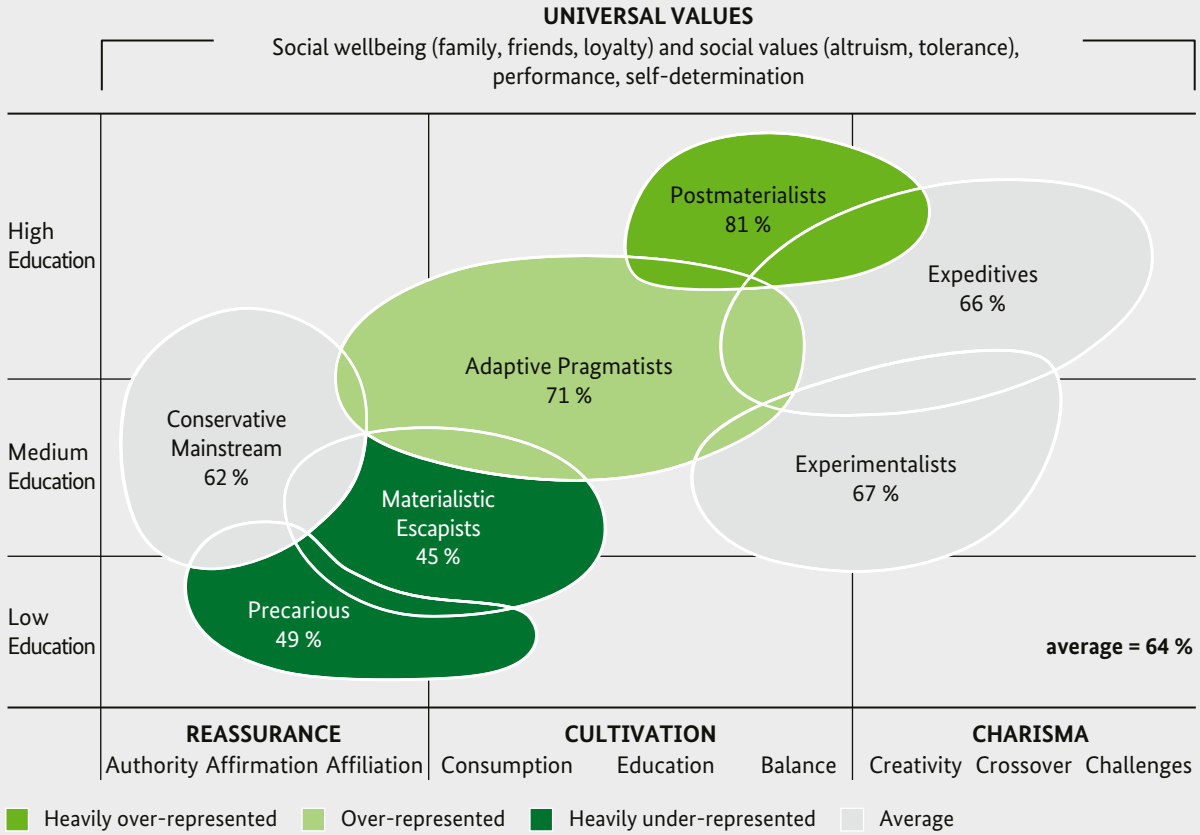
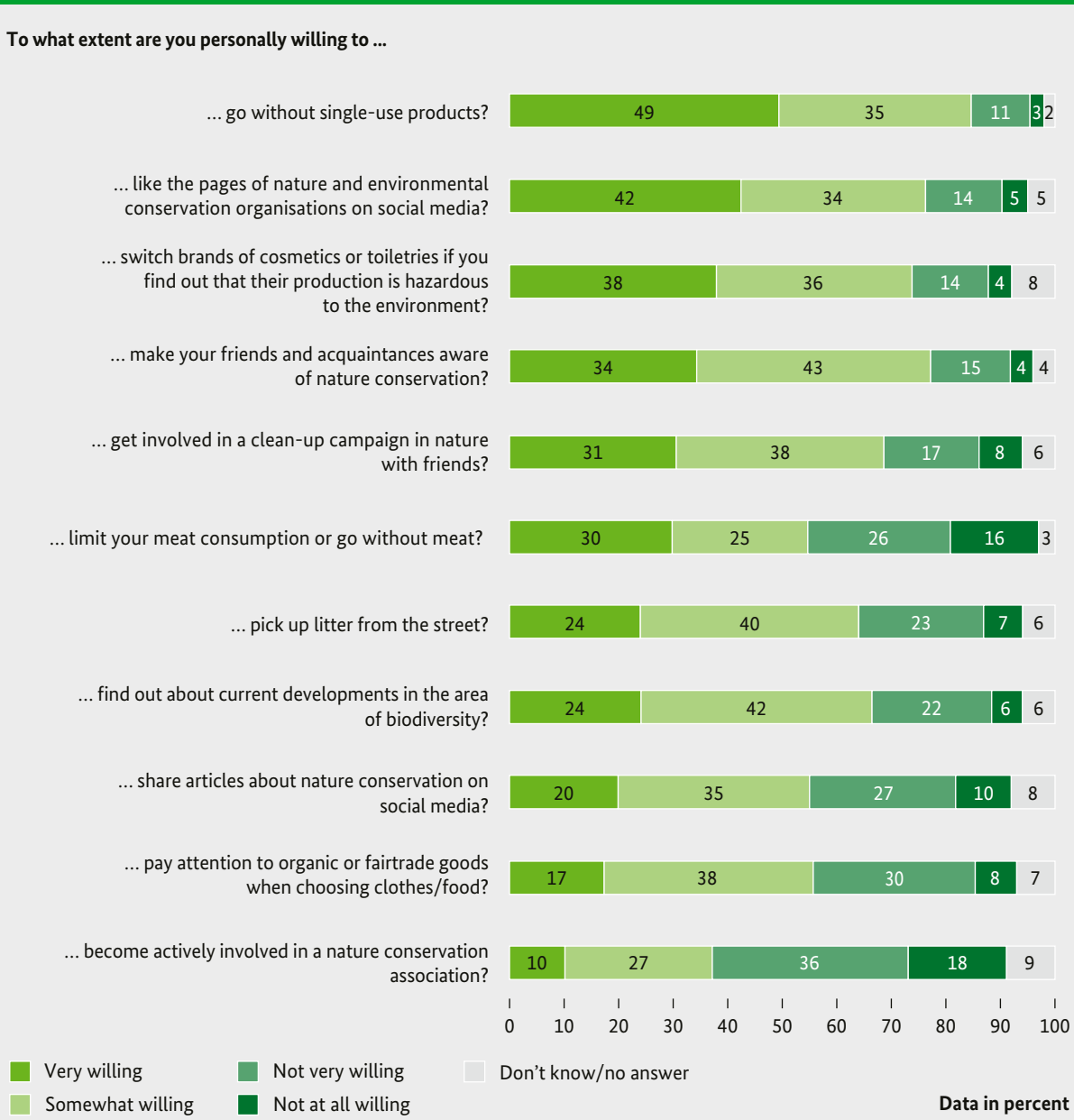


Figure 32: Willingness to get personally involved in nature conservation



There are no sociodemographic differences in the response behaviour of the young people. However, there are differences in the response behaviour of different lifeworlds (see Figure 31): It is primarily the nature conservation-oriented Postmaterialists who consider the environmental protection and nature conservation movements to be very or somewhat important (81 percent, average: 63 percent). Above-average numbers of Adaptive Pragmatists, who are goal-driven and above all characterised by their adaptability, consider such movements to be important ("very/somewhat important": 71 percent). Below-average numbers of Precarious young people, who usually have to battle with the most difficult starting conditions in the comparison of the lifeworlds (such as problematic family relationships, poor school performance, criminality), and the very contemporary and self-centred Materialistic Escapists consider environmental protection and nature conservation movements to be important (Precarious: 49 percent, Materialistic Escapists: 45 percent).

7.4 Willingness to get personally involved in nature conservation

To find out the extent to which young people would be willing to get personally involved in nature conservation, they were asked about eleven behaviours, including consumption, media, and politics.

Young people express a high level of willingness to get personally involved in nature conservation.

Table 9: Willingness to get personally involved in nature conservation according to gender and educational level

How willing are you personally to ...

Response category: **Very willing** Data in percent	Average	Gender		Educational level		
	Ø	M	F	Low	Medium	High
... stop using single-use products (plastic bags, single-use cups, etc.)?	49	43	54	25	41	57
... like the pages of nature and environmental conservation organisations on social media?	42	32	53	27	41	47
... switch brands of cosmetics or toiletries if you find out that their production is hazardous to the environment?	38	37	39	31	36	41
... make your friends and acquaintances aware of nature conservation?	34	29	40	29	31	37
... get involved in a clean-up campaign in nature with friends?	31	23	38	25	26	35
... limit your meat consumption or go without meat?	30	21	38	15	20	38
... pick up litter from the street?	24	20	29	22	24	26
... find out about current developments in the area of biodiversity?	24	22	26	20	22	26
... share articles about nature conservation on social media (e.g. on the decline of insect populations)?	20	20	20	16	18	21
... pay attention to organic or fair trade goods when choosing clothes/ food?	17	18	16	12	18	18
... become actively involved in a nature conservation association?	10	10	11	15	9	10

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

The basic willingness of young people to get personally involved in nature conservation is widespread (see Figure 32): 84 percent of young people surveyed are very or somewhat willing to stop using single-use products. Around three-quarters would like the pages of nature conservation and environmental protection organisations on social media, raise awareness of nature conservation among friends and acquaintances, and change brands of cosmetics or toiletries if they are manufactured in a way that harms nature. In each case, about two-thirds of respondents said they would be willing to get involved in a clean-up campaign with friends, find out about current developments in biodiversity, and pick up litter from the streets. In each case, more than half also said they would be willing to pay attention to organic and fairtrade goods when selecting clothing and food, to share articles about nature conservation on social media, and to limit their meat consumption. The only thing young people show less willingness for is active participation in nature conservation associations ("very/somewhat" willing: 37 percent).

The stated levels of willingness show that there is capitalisable potential for behaviours that help protect nature. However, it must also be taken into account that the unreserved willingness ("very willing") to get actively involved in nature conservation is significantly below 50 percent for almost all behaviours included in the survey.

Some educational and gender differences can be seen in the sociodemographic analysis: The unreserved willingness to stop using single-use products, like the pages of nature and environmental conservation organisations on social media, and limit meat consumption increases as the level of formal education increases (see Table 9). In addition, more girls than boys state that they are unreservedly willing to like the pages of nature and environmental conservation organisations on social media ("very willing": 53 percent and 32 percent respectively), to raise awareness of nature conservation among friends (40 percent and 29 percent respectively), get involved in a clean-up campaign with friends (38 percent and 23 percent respectively), and consume less meat (38 percent and 21 percent respectively).

Table 10: Willingness to get personally involved in nature conservation according to lifeworlds

How willing are you personally to ...

Response category: **Very willing** Data in percent	Average	Conservative Mainstream	Postmaterialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
... stop using single-use products (plastic bags, single-use cups, etc.)?	49	50	80	62	51	44	16	33
... like the pages of nature and environmental conservation organisations on social media?	42	51	64	54	32	43	23	30
... switch brands of cosmetics or toiletries if you find out that their production is hazardous to the environment?	38	44	50	49	35	41	17	29
... make your friends and acquaintances aware of nature conservation?	34	39	59	44	30	28	14	28
... get involved in a clean-up campaign in nature with friends?	31	37	46	39	26	28	14	25
... limit your meat consumption or go without meat?	30	32	50	37	26	29	9	28
... pick up litter from the street?	24	19	46	29	21	25	14	18
... find out about current developments in the area of biodiversity?	24	28	39	34	20	19	11	18
... share articles about nature conservation on social media (e.g. on the decline of insect populations)?	20	25	31	27	14	17	10	16
... pay attention to organic or fair trade goods when choosing clothes/ food?	17	22	14	23	16	19	8	15
... become actively involved in a nature conservation association?	10	11	15	12	8	11	8	10

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

Postmaterialist and Adaptive Pragmatist young people are most willing to get involved in nature conservation.

Analysis of the young people's lifeworlds confirms the already familiar picture: Overall, Postmaterialist and Adaptive Pragmatist young people were most willing to get personally involved in nature conservation. By contrast, the Materialistic Escapists were least willing (see Table 10). For example, 50 percent of Postmaterialists and 49 percent of Adaptive Pragmatists were "very willing" to switch brands of cosmetics or toiletries if manufactured in a way that is harmful to nature. The corresponding figure for Materialistic Escapists was just 17 percent. It is also worth noting that, in addition to the Materialistic Escapists, below-average numbers of Precarious young people were willing to stop using single-use products ("very willing": Materialistic Escapists: 16 percent, Precarious: 33 percent, average: 49 percent) and to like the pages of nature conservation and environmental protection organisations on social media (Materialistic Escapists: 23 percent, Precarious: 30 percent, average: 42 percent). The flexible, usually very confident and lifestyle-oriented Expeditives were also less willing to get involved in the latter activity (32 percent).

8 Energy transition – a generational project

Energy politics is of particular interest in a youth study for both historical and current reasons. Historically, because the social debate about nuclear power in the 70s and 80s resulted in a kind of ecological youth movement whose familiar symbol was the "Atomkraft – nein, danke!" sticker (see Di Nucci et al. 2018, Kitschelt 1980). In the meantime, German energy politics have changed significantly. The 2011 reactor disaster in Fukushima, Japan, was the decisive trigger. Since then, the share of renewable energies in the German power supply has been increasing.

Although criticism of the implementation of the energy transition has increased in recent years (see Wolf et al. 2020), the energy transition and its subgoals (nuclear phase-out, expansion of renewable energies, carbon phase-out, etc.) has seen constantly high levels of support by the population for years (see BMU and BfN 2019). But what do young people think about the energy transition? Are they perhaps more positive than adults regarding the energy transition towards a predominantly renewable energy supply because they have been used to the objectives of energy transition and the changes in the landscape since childhood? Is the increasing involvement of young people in environmental politics (see Albert et al. 2019) also reflected in strong approval of the energy transition? Or are young people more critical of the energy transition and reject it?

8.1 Approval and rejection of the energy transition

Before asking young people to state their attitudes towards the energy transition, the subject was introduced with the following explanation:

"Our daily life would be unimaginable without energy. We need it for heating, for road traffic, and for generating electricity. In Germany, the majority of energy is generated with fuels like coal, crude oil, and natural gas. Switching energy generation to solar, wind, and water power is known as the energy transition. These energy sources are also called renewable energies."

Two-thirds of young people consider the energy transition to be the right way to go.

In response to the question on whether they consider the energy transition to be the right way to go, there is a clear picture of approval by young people (see Figure 33): 66 percent of respondents consider the energy transition to be the right way to go, 21 percent are undecided, two percent do not agree with the energy transition, and eleven percent said they didn't know or had no answer. This shows that, with two-third of respondents, a significant majority of young people is in favour of the energy transition. At two percent, the specific rejection rate is extremely low. The relatively large share of respondents who didn't want to or couldn't give an opinion ("don't know/no answer": eleven percent) indicates that some young people don't feel adequately well informed.

Approval of the energy transition is influenced by the educational level of young people.

The higher the level of formal education, the higher the approval level (see Table 11): Of the young people with a high level of formal education, three-quarters were in favour of the energy transition, while only 42 percent of those with a low level of formal education were in favour. It is worth noting that young people with a low level of formal education were slightly more likely to reject the energy transition than those with a high level of formal education (five percent and one percent respectively), but the more significant finding is that the share of young people with a low level of education who felt unable to give any answer was significantly

Figure 33: Approval and rejection of the energy transition

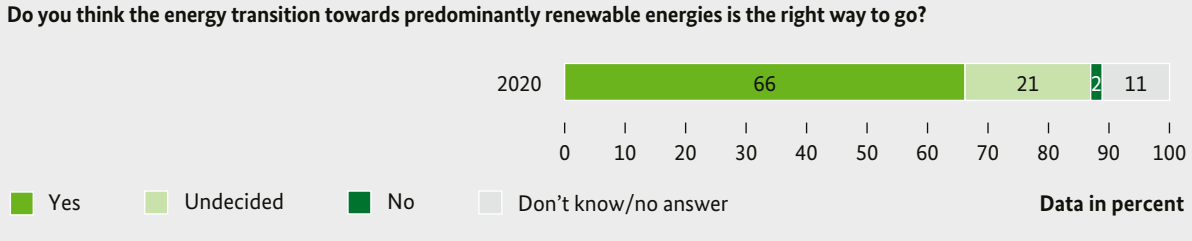


Table 11: Approval and rejection of the energy transition according to educational level

Do you think the energy transition towards predominantly renewable energies is the right way to go?

Data in percent	Average	Educational level		
	Ø	Low	Medium	High
Yes	66	42	58	75
Undecided	21	29	26	16
No	2	5	3	1
Don't know/no answer	11	24	14	8

Heavily over-represented · Heavily under-represented · Over-represented · Under-represented

greater than for those with a high level of education (24 percent and eight percent respectively). For young people, a low level of education does not primarily mean rejection, but rather uncertainty (or disinterest) regarding the energy transition. This shows that there is a need to provide better information in schools about the importance and central concerns of the energy transition.

The responses were not influenced by the gender and age of the young people. The size of town also had no influence. So, even young people who live in a more rural area showed no greater levels of approval or rejection of the energy transition, even though wind power or biogas plant projects will predominantly be implemented in rural regions.

In lifeworlds with a low focus on formal education, approval of the energy transition is below average.

The comparison of lifeworlds confirms that many young people are in favour of the energy transition. In five out of seven lifeworlds of young people, the share of "yes" votes is significantly higher than 60 percent. With 78 percent of "yes" votes, approval is particularly high in the Adaptive Pragmatist lifeworld, which often sees its strengths as adaptability and realism. The lowest number of "yes" votes was counted in the less well-educated lifeworlds of the Precarious and Materialistic Escapists (48 percent and 47 percent respectively).

Table 12: Approval and rejection of the energy transition according to lifeworlds

Do you think the energy transition towards predominantly renewable energies is the right way to go?

Data in percent	Average	Conservative Mainstream	Postmaterialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
Yes	66	69	74	78	68	63	47	48
Undecided	21	19	16	15	20	23	26	30
No	2	1	-	0	1	4	5	5
Don't know/no answer	11	11	10	6	11	10	22	17

Heavily over-represented · Over-represented · Under-represented · Heavily under-represented

9 Agro-genetic engineering and new genetic engineering processes in nature conservation – scepticism predominates

Genetic engineering involves processes by which the genetic makeup of organisms is modified using molecular biological techniques. This causes hereditary changes in the properties of the organisms that would usually not be possible in natural reproduction and conventional breeding. In recent years, during the course of advancing digitalisation and molecular biological research, new genetic engineering processes have emerged, including so-called genome editing processes, which enable precise cutting of DNA and thereby open up new fields of application. They make it easier to modify genetic material and broaden the spectrum of plants, animals, microorganisms, and viruses that are accessible for genetic modification. It is often difficult to predict the specific effects of genetic modifications, as the interactions between genes, organism, and environment are many and varied.

There is ongoing social discourse concerning the use of genetic engineering in different areas of life, for example with regard to the uncertainty of genetic engineering applications for combating world hunger (see for example TAB 2011). Other important ranges of topics in the social discourse concerning genetic engineering and nature are possible environmental damage (see Schiemann et al. 2019, Then et al. 2020) as well as economic, social, and political effects, the relationship between humans and nature, and ethical issues: For which purposes may humans interfere with genetic material and for which purposes do they want to do so (see Eser 2019)? And even within nature conservation and health protection there is controversial discussion about applying genetically modified organisms (GMO), such as in the control of imported invasive species or pathogens.

The 2017 and 2019 Nature Awareness Studies (BMU and BfN 2018, 2020) show that the majority of the adult population supports banning GMOs in agriculture and is of the opinion that the potential effects on nature should always be explored when plants are genetically modified with new genome editing tools. An equally high number of adults is in favour of labelling meat, milk, and eggs originating from animals fed with GMO feed.

This chapter explores the questions of which basic attitudes young people have towards genetic engineering and what their position is on the use of genetic engineering in agriculture. To what extent do they think it is good that humans can use genetic engineering to influence the natural development and diversity of nature? Would they be prepared to eat genetically modified food? Would they like food created using genetically modified feed to be labelled?

9.1 General attitudes towards genetic engineering

Before the young people were asked to answer questions about genetic engineering, they were given the following introductory explanation about the meaning of the term genetic engineering to read:

"The genetic makeup of a living being is stored in building blocks called genes. You have a genetic makeup, too, which determines characteristics like your eye colour. Animals and plants also have a genetic makeup, which researchers can alter in a targeted way. They can, for example, isolate individual genes, separate them, or combine them in different ways. This procedure is called genetic engineering. It can give animals and plants characteristics that they didn't have before."

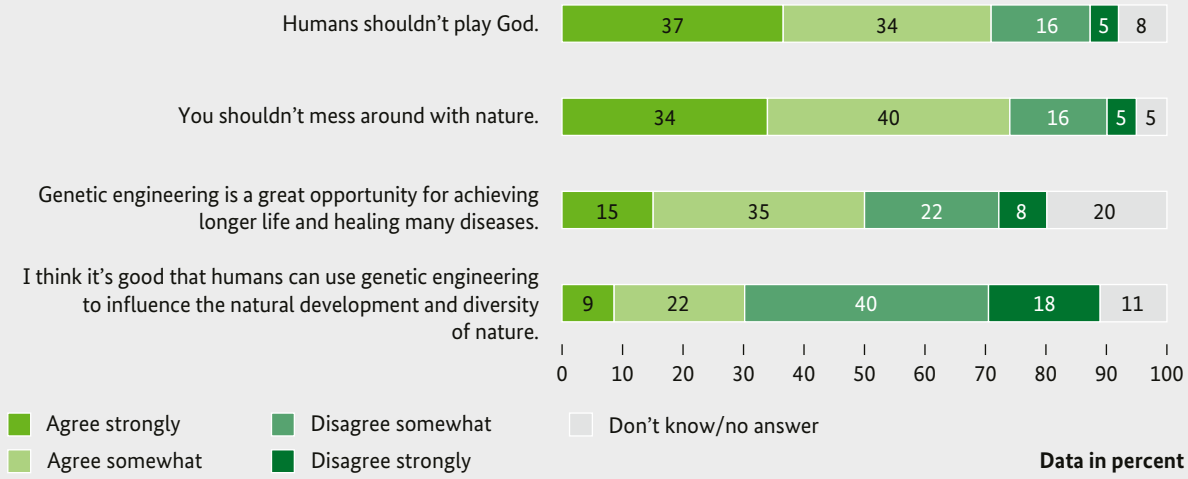
Three out of four young people reject messing around with nature.

Most young people have a sceptical attitude towards genetic engineering: Around three quarters of young people reject messing around with nature (both approval levels), 71 percent think that humans shouldn't play God, and only 31 percent think it's good that humans can use genetic engineering to influence the natural development and diversity of nature (see Figure 34). It is worth highlighting that girls have a much more critical attitude than boys. Forty percent of the girls questioned are "strongly" convinced that humans shouldn't mess around with nature, for boys this figure is 28 percent. Forty-two percent of girls stress that humans shouldn't play God (highest approval level), while 31 percent of boys are of this opinion.

Young people are divided on the question of whether genetic engineering is an opportunity for achieving longer life and healing diseases: Fifty percent agree (somewhat), 30 percent disagree (somewhat), and some 20 percent give no answer. Again, it is girls who are particularly reserved here. Only eleven percent agree unreservedly with the statement (average: 15 percent).

Figure 34: General attitudes towards genetic engineering

What do you think of the following statements on genetic engineering?
Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with the statements?



Scepticism towards genetic engineering is most widespread in the lifeworlds of Postmaterialists and the Conservative Mainstream.

In the comparison of lifeworlds, the more educated Postmaterialists and the nature and homeland-oriented Conservative Mainstream are most critical of genetic engineering. The least scepticism comes from the ranks of the Expeditives with diverse interests in the unconventional, and the leisure-oriented Materialistic Escapists (see Table 13). For example, 51 percent of Postmaterialists and 49 percent of the Conservative Mainstream strictly reject messing around with nature (highest approval levels). By contrast, this figure is 20 percent for Expeditives and 17 for Materialistic Escapists. It is also striking that among all lifeworlds, the Expeditives are most frequently of the unreserved opinion that genetic engineering is a great opportunity for achieving longer life and healing many diseases; Postmaterialists are least often of this opinion (highest approval levels: Expeditives: 21 percent, Postmaterialists: six percent, average: 15 percent).

Table 13: General attitudes towards genetic engineering according to lifeworlds

How do you rate the following statements about genetic engineering? Do you agree strongly, agree somewhat, disagree somewhat, or not agree at all with the statements?

Response category: Agree strongly Data in percent	Average	Conservative Mainstream	Postmaterialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
Humans shouldn't play God.	37	49	58	40	24	35	25	36
You shouldn't mess around with nature.	34	49	51	38	20	35	17	34
Genetic engineering is a great opportunity for achieving longer life and healing many diseases.	15	13	6	19	21	17	11	11
I think it's good that humans can use genetic engineering to influence the natural development and diversity of nature.	9	7	1	13	7	9	10	8

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

9.2 Attitudes towards the deployment of genetic engineering in agriculture

A significant majority is of the opinion that potential effects on nature should always be explored when plants are specifically genetically engineered.

Eighty-six percent of young people are of the opinion that potential effects on nature should always be explored when plants are specifically genetically engineered, 61 percent are even "strongly" of this opinion (see Figure 35). This result highlights the major significance of the precautionary principle when deploying genetic engineering in agriculture.

Young people also have clear reservations about genetically modified foods: Only 36 percent consider eating genetically modified foods to be no problem or a somewhat insignificant problem. In this connection, freedom of choice is particularly important to young people, as 83 percent would like commerce to label foods made of animals that have been fed genetically modified feed (both approval levels).

Two thirds express basic reservations about genetically modifying nature.

In addition to concerns about genetically modified food, the vast majority of young people express basic reservations: 65 percent agree "strongly" or at least "somewhat" with the statement that humans have no right to genetically modify plants and animals. The situation is different with regard to the argument that genetic engineering in agriculture is an important building block in the struggle against world hunger. Forty-seven percent agree, 37 percent disagree, and 16 percent didn't trust themselves to answer. Thirty-six percent of young people consider eating genetically modified foods to be no problem or at least a somewhat insignificant problem.

Educated young people and girls in particular stress that potential effects on nature should always be explored.

The insistence that potential effects on nature should always be explored when plants are specifically genetically engineered increases with young people's formal education (highest approval level: low education level: 46 percent, medium education level: 49 percent, high education level: 72 percent). The same applies to the demand for mandatory labelling: Forty-eight percent of young people with a low level of formal education unreservedly demand that commerce should label foods made of animals that have been fed genetically modified feed. In the group with a high level of formal education, this figure is considerably greater (67 percent).

The differences between the genders are also striking (see Table 14). Girls are less able to imagine eating

Figure 35: Attitudes towards the deployment of genetic engineering in agriculture

What do you think of the following statements on genetic engineering?
Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with the statements?

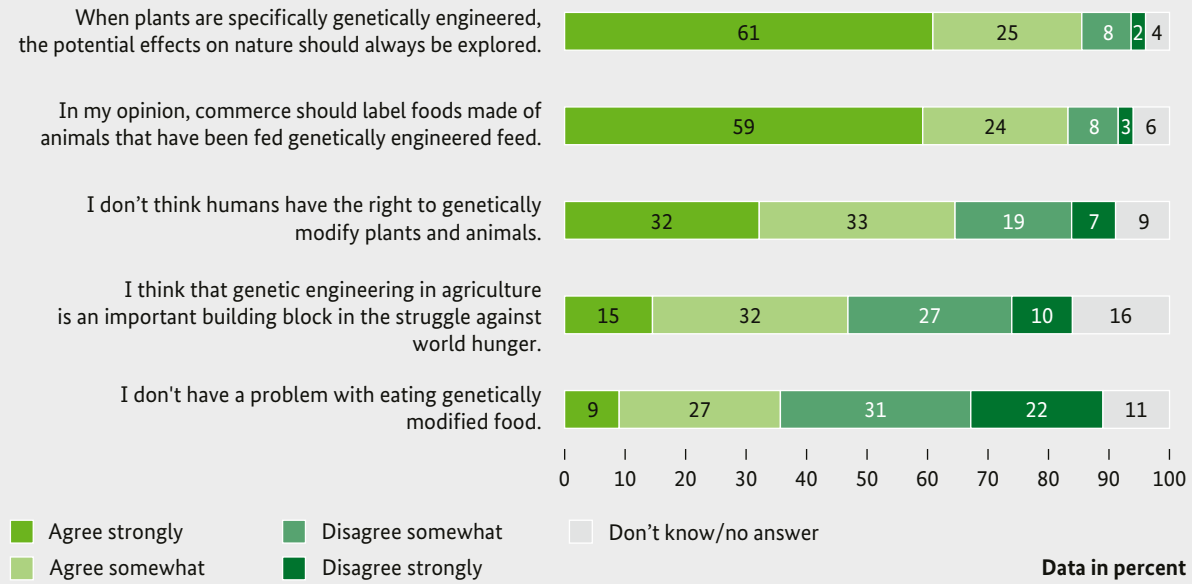


Table 14: Attitudes towards the deployment of genetically modifed organisms in farming by gender, educational level, and town size

How do you rate the following statements about genetic engineering? Do you agree strongly, agree somewhat, disagree somewhat, or not agree at all with the statements?

Response category: Agree strongly Data in percent	Average	Gender		Educational level			Town size (population)			
	Ø	M	F	Low	Medium	High	<20,000	20,000 to <100,000	100,000 to <500,000	500,000+
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	61	53	70	46	49	72	69	65	55	62
In my opinion, commerce should label foods made of animals that have been fed genetically modified feed.	59	55	64	48	54	67	65	63	60	54
I don't think humans have the right to genetically modify plants and animals.	32	25	40	38	36	30	35	31	30	34
I think that genetic engineering in agriculture is an important building block in the struggle against world hunger.	15	18	11	13	14	16	20	15	15	12
I don't have a problem with eating genetically modified food.	9	14	3	13	9	8	15	6	9	9

Heavily over-represented | Over-represented | Under-represented | Heavily under-represented

genetically modified food than boys (highest approval level: girls: three percent, boys: 14 percent). They also tend to express basic reservations (girls: 40 percent, boys: 25 percent) and more often insist that potential effects on nature should always be explored (girls: 70 percent, boys: 53 percent).

Furthermore, the comparison of town sizes shows: Young people who live in the countryside or in a small town can most likely imagine eating genetically modified foods (highest approval level: population below 20,000: 15 percent, average: nine percent). Overall, however, town size has little bearing on the answers of the respondents.

Young Postmaterialists take the strongest stance against genetic engineering in agriculture.

By far the greatest ethical concerns about genetic engineering in agriculture were expressed by young Postmaterialists. In this lifeworld, which is oriented towards sustainability and the common good, 51 percent are unreservedly of the opinion that humans have no right to genetically modify plants and animals (average: 32 percent). In contrast to this, for the adventurous Expeditive milieu and Materialistic Escapist milieu with 23 percent and 20 percent respectively, the figures are significantly lower, merely a minority.

Along with the Postmaterialists, the Adaptive Pragmatists, who are particularly willing to adapt and compromise, consider it very important that potential effects on nature are always explored (highest approval level: Postmaterialists: 83 percent, Adaptive Pragmatists: 74 percent) and that commerce should label foods made of animals that have been fed genetically modified feed (Postmaterialists: 78 percent, Adaptive Pragmatists: 71 percent). The educationally disadvantaged Precarious milieu and the Materialistic Escapists concerned with status expressed both of these demands less vehemently (see Table 15).

Overall, the data indicates a largely critical attitude among young people towards genetic engineering in wild populations and agriculture, the relevance of the precautionary principle, and an emphasis on freedom of choice.

Table 15: Attitudes towards the deployment of genetic engineering in agriculture by lifeworld

How do you rate the following statements about genetic engineering? Do you agree strongly, agree somewhat, disagree somewhat, or not agree at all with the statements?

Response category: **Agree strongly** Data in percent	Average	Conservative Mainstream	Postmateri-alists	Adaptive Prag-matists	Expeditives	Experimen-talists	Materialistic Escapists	Precarious
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	61	69	83	74	62	58	35	43
In my opinion, commerce should label foods made of animals that have been fed genetically modified feed.	59	67	78	71	57	58	36	42
I don't think humans have the right to genetically modify plants and animals.	32	39	51	31	23	36	20	41
I think that genetic engineering in agriculture is an important building block in the struggle against world hunger.	15	16	14	13	17	11	13	15
I don't have a problem with eating genetically modified food.	9	13	6	7	13	7	8	6

Heavily over-represented Heavily under-represented

10 Digitalisation in nature conservation – the differentiated attitude of digital natives

Digitalisation is a key issue of our time and the digital transformation is in full swing. The technological developments are rapid and change the way we learn, communicate, and consume – in short: how we live. Digitalisation affects almost all sectors and areas of our modern society. For many, digitalisation is not just a trend of the times with no other alternative, but is associated with technological and social promises of a better future. Others highlight the downsides – in areas such as negative environmental effects like energy consumption, data security, and the fate of individual freedom in the face of Big Data (see Welzer 2016).

As a relatively recent technological revolution, digitalisation is still a novelty for many older people that requires rethinking and relearning, and is sometimes overwhelming. Young people, however, have grown up with digitalisation and therefore know what they are doing: They are the "digital natives". Whether smartphone, streaming, or social media: Young people use these formats more often and for longer (see BVDW 2018).

Yet digitalisation is also advancing in nature conservation. This carries the hope of being better able to reach the young, digital generation in particular. Opportunities are seen especially in the areas of data collection, knowledge transfer, and communication. Such possibilities have been discussed for a long time (see Arts et al. 2015), for example with regard to the considerable expansion of data availability on nature, conditions in nature, and the ways in which nature can be used, as well as systematic evaluation, digital species identification options, participative forms of knowledge and usage, and a broadening of communication about nature and nature conservation.[16] The "Flora Incognita" app funded by the federal biodiversity program, for example, is the first large-scale application of artificial intelligence in Germany used to identify plants. It employs methods for image processing and pattern recognition that are also used for automated facial recognition. Another example is the ProBat software. The BfN-funded software uses the measured flight activity of bats to calculate location-specific downtimes for wind turbines, which significantly reduces the risk of collision.

In addition to the opportunities of digitalisation in general and nature conservation in particular, digitalisation also entails risks: Mining rare raw materials, energy consumption for servers, social control, substitution of real nature experiences (see Kuntsman and Rattle 2019), to name but a few. There is a widespread fear that young people are becoming more and more estranged from nature and "real" (analogue) nature experiences as a result of the visibly increasing amount of time they spend in virtual (illusory) worlds (see Brämer et al. 2010). Many people are therefore calling for stronger social and political control (see Höfner and Frick 2019). But what do young people themselves have to say on the matter?

To address this question, the young people were first asked about what they think of the opportunities and risks of digitalisation in general and digitalisation in nature conservation in particular. They were then asked about their personal attitudes towards the use of the opportunities that digitalisation offers the field of nature conservation.

10.1 Perception of the opportunities and risks of digitalisation

Young people see considerably more opportunities than risks in digitalisation.

The general assessment of the opportunities and risks of digitalisation fell clearly on the side of opportunities (see Figure 36): Almost half of young people (49 percent) see "many opportunities" or "more of an opportunity" in digitalisation. By contrast, only 14 percent see "many risks" or "more of a risk". One third considered digitalisation as an ambivalent development ("partly opportunities/partly risks"), four percent did not want to answer. The positive assessment among boys (57 percent "more of an opportunity" or "many opportunities") is significantly higher than among girls (40 percent). Yet this does not necessarily mean that girls see more risks; they are merely far more cautious in their assessment of the opportunities and stress the ambivalences of digitalisation more strongly (39 percent "partly opportunities/partly risks" compared to 27 percent among boys).

It is also striking that the assessment of the opportunities of digitalisation is significantly weaker among boys with a lower level of formal education: 33 percent compared to 49 percent on average see digitalisation as (more of) an opportunity. In the area of low formal ed-

Table 16: Perception of the opportunities and risks of digitalisation by gender and educational level

Do you think that digitalisation provides more opportunities or poses more risks?

Data in percent	Average	Gender		Educational level		
	Ø	M	F	Low	Medium	High
Many opportunities/more of an opportunity	49	57	40	33	48	52
Many risks/more of a risk	14	12	16	20	16	12
Partly opportunity/partly risk	33	27	39	36	31	33
Don't know/no answer	4	4	5	11	5	3

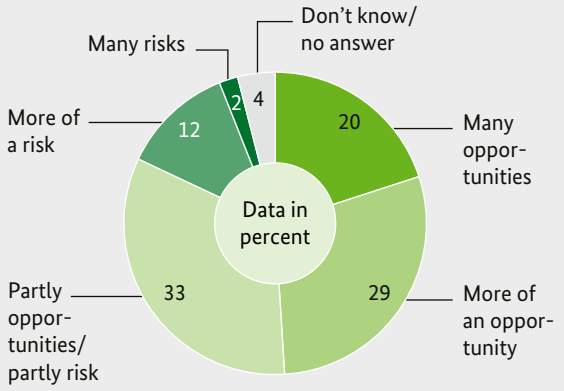
Heavily over-represented · Over-represented · Under-represented · Heavily under-represented

ucation, the response category "don't know/no answer" is far stronger at eleven percent than the average (four percent).

The lifeworld analysis reveals that in the particularly digitally savvy lifeworlds of Expeditives, who describe themselves as "always on", and Adaptive Pragmatists, who orient themselves towards the modern mainstream, the opportunities are stressed much more strongly than average ("many opportunities/more of an opportunity": 69 percent and 61 percent respectively, average: 49 percent). In the educationally disadvantaged lifeworlds of the Materialistic Escapist milieu and the Precarious milieu, however, the risks are seen as more apparent ("many risks/more of a risk": 22 percent and 24 percent respectively, average: 14 percent).

Figure 36: Perception of the opportunities and risks of digitalisation

There is currently a lot of discussion about digitalisation. Some emphasise the opportunities, others the risks. How do you personally feel about it? Do you think that digitalisation provides more opportunities or poses more risks?



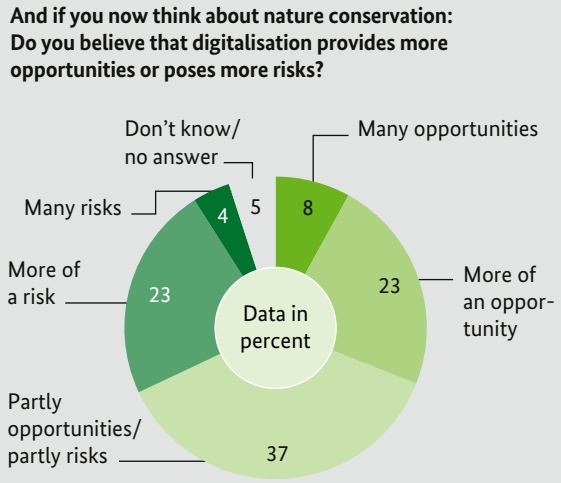
The majority of young people see both the opportunities and risks of digitalisation in nature conservation.

Compared with the assessment of digitalisation in general, the perception of the opportunities of digitalisation in nature conservation is somewhat more reserved: 31 percent see "many opportunities" or "more of an opportunity", 27 percent see "many risks" or "more of a risk", 37 percent see equal opportunities and risks ("partly opportunities/partly risks"), and five percent could not give an answer. The large proportion of young people who responded with an ambivalent assessment or no answer (together 42 percent) indicates that many young people find it difficult to assess digitalisation in the context of nature conservation – possibly because they find it hard to imagine.

Again, it is boys who see more opportunities than girls ("many opportunities/more of an opportunity": 36 percent and 24 percent respectively). Conversely, girls see more risks than boys in this issue ("many risks/more of a risk": 33 percent and 20 percent respectively). Furthermore, the comparison of educational level reveals that young people with a low level of formal education see the least risks ("many risks/more of a risk": low education level: 18 percent, medium education level: 23 percent, high education level: 31 percent).

In the comparison of lifeworlds, it was again the Expeditives and Adaptive Pragmatists who gave particularly positive answers: 41 percent and 38 percent respectively are of the opinion that digitalisation in nature conservation offers (more of) an opportunity rather than a risk. The Materialistic Escapists and the Precarious milieu were much less optimistic ("many opportunities/more of an opportunity": 21 percent and 15 percent respectively).

Figure 37: Perception of the opportunities and risks of digitalisation in nature conservation



10.2 Use of the opportunities that digitalisation offers the field of nature conservation

In addition to the analysis of the assessed opportunities and risks of digitalisation, the attitudes of the young people with regard to the use of the possible opportunities that digitalisation offers nature conservation were also examined.

Over 70 percent of young people are in favour of greater use of digitalisation in nature conservation.

71 percent of young people agreed "strongly" or at least "somewhat" with the view that nature conservation should try to make better use of the opportunities offered by digitalisation. Only six percent disagreed "somewhat" or "didn't agree at all", 19 percent were indifferent ("partly agree/partly disagree"), and four percent were unable to form an opinion (see Figure 38). Agreement increased with the level of formal education (low education level: 50 percent, medium education level: 65 percent, high education level: 78 percent). This result is particularly interesting in view of the previous question, in that 42 percent were not able to clearly assess the opportunities and risks of digitalisation, and 27 percent saw the risks as predominant.

The analysis according to young lifeworlds is also informative: In five of the seven lifeworlds, more than two thirds of their members are of the opinion that nature conservation should make greater use of the opportunities of digitalisation. Only in the lifeworlds of Materialistic Escapists and the Precarious milieu is this figure lower (see Figure 39). Agreement is most widespread amongst the Postmaterialists, who have a strong interest in nature conservation (85 percent), and amongst the particularly digitally savvy lifeworlds of the Expeditives (82 percent) and Adaptive Pragmatists (80 percent).

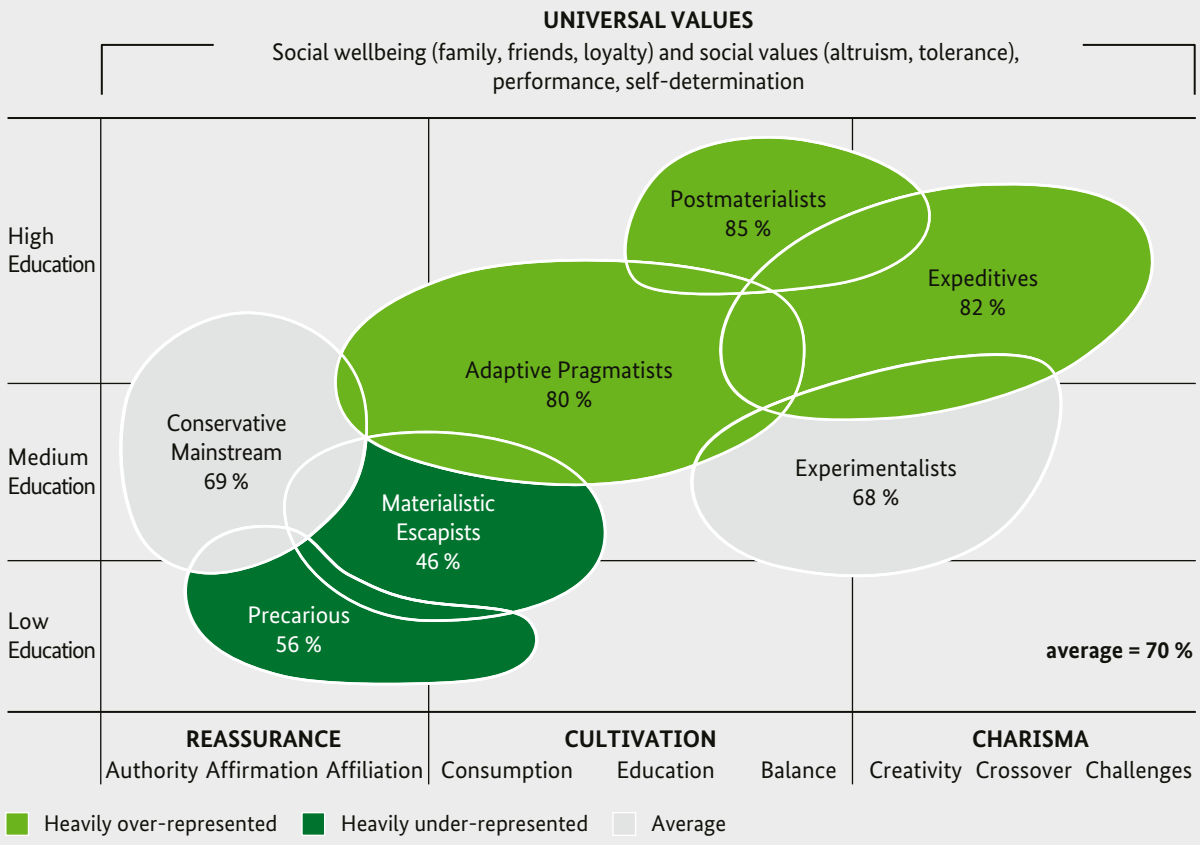
The majority of young people reported that they were prepared to use a nature conservation app.

Fifty-seven percent of young people can imagine using an app to find out about natural hazards, successes in nature conservation, or even possible actions that they could personally take (both approval levels), 19 percent would not use such an app (or be less likely to do so), 21 percent are not sure, and three percent gave no answer (see Figure 38). There are barely any noticeable sociodemographic differences. It is worth mentioning that the willingness of young people with a low level of formal education to use such an app was below average (both approval levels: 46 percent, average: 57 percent).

Figure 38: Attitudes towards the use of the opportunities that digitalisation offers the field of nature conservation

Figure 39: Attitudes towards the use of the opportunities that digitalisation offers the field of nature conservation according to lifeworlds

Nature conservation should try to make better use of the opportunities offered by digitalisation.
Response category "Agree strongly/agree somewhat"



The differences are more pronounced in the response behaviour of the lifeworlds: Postmaterialist young people showed the greatest willingness to use an app to find out about natural hazards, successes in nature conservation, or even possible actions that they could personally take for nature ("very/somewhat likely": 71 percent). In this lifeworld, sustainability is not an empty word, but a solid guideline in life. The willingness of Adaptive Pragmatists to use an app is also above average – they may not have plans for making a "better world" but orient themselves to what is achievable and – where possible – want to take responsibility (65 percent). The willingness of Expeditives to use an app is below average (49 percent). Young people in this lifeworld have little orientation towards control and authority. They tend to reject offerings which they feel are "pushed upon" them. The least willingness to use a nature conservation app was demonstrated by Materialistic Escapists (39 percent), who tend not to look to the future and prefer to concentrate on life in the "here and now".

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Abbreviations

BfN	Federal Agency for Nature Conservation
BIK	Nationwide geographical classification system
BioDiv2Go	Biodiversity to go
BISA	Biodiversity at school
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BVDW	German Digital Media Association
CO_2	Carbon dioxide
DNA	Deoxyribonucleic acid
e.g.	exempli gratia
et al	et alii/et aliae/et alia
etc.	et cetera
EU	European Union
e.V.	Registered association
GESIS	German Social Science Infrastructure Services Association
GmbH	Limited liability company
GPS	Global Positioning System
GMO	Genetically modified organism
Ed.	Editor
AI	Artificial intelligence
n	Number of characteristic attributes
NBS	National Strategy on Biological Diversity
PIK	Potsdam Institute for Climate Impact Research
QR	Quick response
SPSS	Statistical and analytic software from IBM (Statistical Package for the Social Sciences)

TAB	Office of Technology Assessment at the German Bundestag
WBGU	German Advisory Council on Global Change

Basic count

Chapter 2: The connection between humans and nature

A2.1 I would like to know what spontaneously comes to mind regarding the topic of nature. What is nature for you? Please list as many terms as you can think of. (Open question, multiple answers possible) (Figure 2)

Data in percent		Data in percent	
Animal world	61	Natural/environmental catastrophes & destruction	7
Plant life	60	Climate	6
Recreation, leisure, & experiencing nature	52	Seas	5
Landscape/nature & landscape objects	50	Exploitation	3
Environmental/nature/animal conservation	13	Sky phenomena	3
Bodies of water/lakes	13	Other associations	45

Animal world – subcategories (61 %)

Data in percent		Data in percent	
Animals in general	52	Bees	1
Birds	5	Deer	1
Insects	4	Other insects and spiders (spiders, flies, mosquitoes, fireflies/ants)	1
(Native) wild animals (foxes, wild boar, hedgehogs, squirrels, bears etc.)/wild animals/predators	3	Fish	1
Mammals	1	Other	3
Animal diversity/different animals	1		

Plant life – subcategories (60 %)

Data in percent		Data in percent	
Plants in general	39	Grass/grasses/lawns	2
Trees	21	Fungi	2
Green/lots of greenery	12	Plant diversity/different plants	1
Flowers	4	Other comments	2

Recreation, leisure, & experiencing nature – subcategories (52 %)

Data in percent		Data in percent	
Relax/unwind/recharge	22	Sport/activity/sports in nature	1
Good/fresh/clean/healthy air	18	Adventure/experiencing something	1
Freedom	15	Fragrance/smell/smells good/good odour	1
Quiet/calm/still	14	Wellbeing/feeling good	1
Leisure/spending leisure time in nature/excursions	2	Holiday	1
Hiking/going for a walk	2	Observing/watching animals	1
Health	2	Retreat	1
Joy/fun/being happy	2	Other comments	1
Pleasure/enjoyment	1		

Landscape/nature & landscape objects – subcategories (50 %)

Data in percent		Data in percent	
Woods/forest	21	Natural	2
Wild/wilderness	7	Undeveloped areas/landscapes/no industry/no streets	2
Meadows/flowering meadows	6	Parks/green spaces/gardens	1
Habitat/biosphere/biotope	6	Beautiful, clean, healthy landscape/nature/environment	1
Untouched nature	5	Stones/minerals	1
Nature/environment	4	Expanse/horizon/vastness	1
Landscape in general	3	Jungle/rainforest/pristine forest//tropics	0.4
Outside/everything that surrounds us/my environment	3	National parks/nature parks	0.4
Ecosystem/environmental	2	Other comments	3
Mountains/Alps	2		

Environmental/nature/animal conservation – subcategories (13 %)

Data in percent		Data in percent	
In need of protection/must be protected/preserved	3	Must be preserved/important for future generations	1
Nature is important/necessary/irreplaceable	3	No pollution/no rubbish/no plastic	1
Basis for human life/life	2	Species conservation	0.4
Environmental/nature conservation	2	Other comments	2
Protected areas	1		

Bodies of water/lakes – subcategories (13 %)

Data in percent		Data in percent	
Water/bodies of water	6	Streams/brooks	1
Lakes	6	Other comments	1
River/rivers	3		

Natural/environmental catastrophes & destruction – subcategories (7 %)

Data in percent		Data in percent	
Environmental destruction/destruction/in danger/threatened	3	Nature/environmental catastrophes	1
Climate change	1	Other comments	2
Environmental pollution	1		

Climate – subcategories (6 %)

Data in percent		Data in percent	
Climate	2	Seasons/autumn/winter/spring/summer	1
Weather	2	Wind/tornadoes	1
Precipitation/rain/snow	1	Other comments	1

Seas – subcategories (5 %)

Data in percent		Data in percent	
Sea/ocean	4	Other comments	1
Beach/beaches	1		

Exploitation – subcategories (3 %)

Data in percent		Data in percent	
Fields	2	Other comments	1
Food/fruits/vegetables	1		

Sky phenomena – subcategories (3 %)

Data in percent		Data in percent	
Sun/sunrise/sunset	2	Other comments	1
Sky/clouds	1		

Other associations – subcategories (45 %)

Data in percent		Data in percent	
Beauty	15	Evolution/development/growth	1
Species diversity/diversity/very diverse	11	Bright/colourful	1
Living beings/abstract life	8	Human beings	1
Fascinating/a wonder/unusual/unique	3	Interesting	1
Peace	3	God/created by God/God's creation	1
Everything that has not been created/influenced by human beings	3	Exciting	1
Cleanliness/clean/purity/pure/clear	3	Education/learn something/learn something new	1
Earth/our Earth	2	Love/lovingly	1
Homeland/at home	1	Symbiosis	1
Cycle	1	Other comments	12
Few/no people/isolated	1	No answer	1
Fresh/freshness	1		

A2.2 Please tell me whether you agree strongly, agree somewhat, disagree somewhat, or do not agree at all with the following statements.

1) Personal significance of nature (Figure 3)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/no answer
Nature is part of a good life.	66	26	6	1	1
Being in nature makes me happy.	46	42	8	3	1
Sometimes I feel as comfortable in nature as I do with friends.	33	37	19	7	4
The wilder the nature, the more I like it.	23	41	23	6	7
I don't feel comfortable in nature.	5	8	21	61	5

2) Perception of the endangerment of nature and attitudes towards nature protection (Figure 5)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/no answer
It is up to humans to protect nature.	65	26	5	1	3
We may only use nature in such a way that affords coming generations the same opportunity.	61	27	6	3	3
It angers me that so many people treat nature so recklessly.	56	34	5	3	2
Nature conservation is necessary in order to meet the challenges of climate change.	55	32	7	1	5
We should follow the laws of nature more closely.	40	41	11	2	6

3) Nature conservation caught between politics and economics (Figure 6)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/no answer
In times of economic crisis, nature conservation also has to make do with less money.	9	27	35	18	11
Nature must not be allowed to stand in the way of economic development.	4	15	39	31	11

Chapter 3: Youth and the relationship with nature during the coronavirus crisis

A3.1 How often were you outside in nature in the past months compared to before the coronavirus crisis? (Figure 7)

Data in percent	
Far more often	20
Somewhat more often	32
No difference	27
Somewhat less often	16
Far less often	5

A3.2 How often did you consciously go outside in nature in the past months to distract yourself, relax, or relieve stress compared to before the coronavirus crisis? (Figure 8)

Data in percent	
Far more often	19
Somewhat more often	36
No difference	32
Somewhat less often	8
Far less often	5

A3.3 How often did you consciously go outside in nature in the past months to exercise and do sport compared to before the coronavirus crisis? (Figure 9)

Data in percent	
Far more often	16
Somewhat more often	28
No difference	36
Somewhat less often	13
Far less often	7

A3.4 Has the importance of nature to you changed compared to before the coronavirus crisis? For me, nature is now ... (Figure 10)

Data in percent	
Far more important	18
Somewhat more important	34
Just as important	45
Somewhat less important	3
Far less important	0

A3.5 Do you agree strongly, agree somewhat, partly agree/partly disagree, disagree somewhat, or not agree at all with the following statements? (Figure 11)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all
I have thought about whether the coronavirus crisis is connected with problems related to how we deal with nature (such as climate change or the extinction of animal and plant species).	15	27	28	19	11
During the coronavirus crisis, less money should be spent on the protection of nature.	3	10	23	34	30
The coronavirus crisis is a health issue and has nothing to do with the condition of nature and the environment.	12	24	31	22	11

Chapter 4: Awareness of biodiversity

A4.1 Are you familiar with the term "biodiversity"? (Figure 12)

Data in percent	
I've heard of it and I know what the term means.	35
I've heard of it but I don't know what the term means.	48
I've never heard of it.	12
Don't know	5

A4.2 Can you please tell me what the term "biodiversity" means to you? (Open question, multiple answers possible) (Filter: only people who have heard the term "biodiversity" and know what the term means.) (Figure 13)

Data in percent	
Diversity of species (animals and/or plants)	88
Diversity of ecosystems, habitats	22
Diversity of genes, genetic information, genetic makeup	10
Other	24

A4.3 How convinced are you that biodiversity on Earth is in decline? Are you ... (Figure 14)

Data in percent	
Very convinced	28
Somewhat convinced	44
Undecided	17
Somewhat unconvinced	4
Completely unconvinced	1
Don't know/no answer	6

Chapter 5: Species knowledge

A5.1 Do you agree strongly, somewhat agree, partly agree/partly disagree, somewhat disagree, or not agree at all with the following statements? (Figure 15)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
I would like to know more animal and plant species by name.	28	32	26	10	3	1
I know a lot about the local wildlife.	8	30	39	18	4	1
I am very familiar with the local plant life.	4	13	38	32	11	2

A5.2 Please select three species groups that you would like to know more about from the following list (Figure 16)

Data in percent	
Mammals	52
Trees	42
Birds	41
Flowering plants	39
Reptiles and amphibians	34
Fish	23
Insects (beetles, bees, butterflies, etc.)	23
Fungi	22
Spiders	8
Ferns and mosses	8
Mussels and snails	7

A5.3 Where, in your opinion, should more knowledge about species diversity be communicated? Please select three options from the following selection. (Figure 17)

Data in percent	
Schools	67
Internet (websites, video platforms, etc.)	31
Zoos and animal parks	30
Digital media (apps, QR codes, etc.)	29
Television	25
Guided nature tours	23
Information available locally (information centre, information boards, etc.)	18
General educational institutions (for example adult educational institutions)	15
Botanical gardens	15
Parents, family	14
Nature conservation associations	13
Universities	8
Open-air museums	7
Occupational environment	5

Chapter 6: Protected areas

A6.1 What comes to mind when you think about protected areas? Please list as many terms as you can think of. (Open question, multiple answers possible) (Figure 18)

Data in percent		Data in percent	
Landscape/nature	52	Prohibitions/regulations	9
Protected area categories	36	Bodies of water/lakes	8
Protection purpose	35	Seas	6
Animals/plants/living beings	34	Meadows/fields	2
Natural/environmental catastrophes & destruction	12	Other associations	37
Recreation/experiencing nature	9		

Landscape/nature – subcategories (52 %)

Data in percent		Data in percent	
Nature/environment	21	Parks/green spaces/gardens	2
Woods/forest	20	Jungle/pristine forest/rainforest	2
Habitat/biosphere/biotope	7	Wild/wilderness	1
Fenced off/blocked off/cordoned off spaces/ areas	3	Ecosystem/environmental	1
Untouched nature	3	Mountains/Alps	1
Natural	3	Undeveloped areas/landscapes (no streets, houses, etc.)	1
Marshes/moors	2	Big/open	1
Green/lots of greenery/green spaces	2	Bird nesting sites/bird nests/breeding grounds	1
Landscape in general	2	Other comments	1
Beautiful, clean, healthy landscape/nature/environment	2		

Protected area categories – subcategories (36 %)

Data in percent		Data in percent	
Nature reserves	17	Protected areas	2
National parks	7	Bird sanctuaries	2
Specific protected areas (Harz, Eifel, Bavarian forest, etc.)	6	Landscape reserves	1
Nature parks	5	Marine conservation areas	1
Water protection areas	4	Botanical reserves	1
Reserves	3	Forest reserves	1
Monuments/natural monuments	3	Bundeswehr/military land/border areas	0.4
Wildlife reserves	2	Other comments	2

Protection purpose – subcategories (35 %)

Data in percent		Data in percent	
Environmental/nature conservation	14	Bird conservation	1
Animal conservation	10	Climate protection	1
In need of protection/must be protected	10	Protection of habitats	1
Species conservation	6	No hunting allowed	1
Plant conservation	2	Protection of the forests	0.3
Landscape conservation	2	Other comments	1
Water/body of water protection	2		

Animals/plants/living beings – subcategories (34 %)

Data in percent		Data in percent	
Animals in general	25	Animal diversity/different animals	2
Plants in general	10	Rare/endangered plants	2
Trees	4	Insects	1
Birds	3	Living beings/life	1
Rare/endangered animals	2	Other comments	1
Wild animals (wolves, deer, hares, tigers, elephants...)/wild animals/predators	2		

Natural/environmental catastrophes & destruction – subcategories (12 %)

Data in percent		Data in percent	
Extinction/critically endangered/vulnerable species	3	Exhaust gases/CO_2 emission	1
Threatened/threat/endangered/endangerment	3	Rubbish/waste/littering of the environment	1
Climate change	2	Poachers/poaching	0.4
Environmental pollution	1	Other comments	2
Deforestation/clearing of forests	1		

Recreation/experiencing nature – subcategories (9 %)

Data in percent		Data in percent	
Quiet/calm/still/peaceful	4	Good/fresh/clean/healthy air	1
Zoo/animal park/wildlife park/bird park	2	Hiking/going for a walk	1
Relax/unwind/recharge	1	Regeneration	1
Free/freedom	1	Other comments	1

Prohibitions/regulations – subcategories (9 %)

Data in percent		Data in percent	
Regulations/prohibitions/rules/specified routes (for visitors)/no access/no entry	6	Sign/signs/green signs (showing birds/owls)	1
Under surveillance/strictly observed/security/ strictest security measures	2	Other comments	1

Bodies of water/lakes – subcategories (8 %)

Data in percent		Data in percent	
Lakes	5	Ponds/pools	1
Water/bodies of water	2	Other comments	1
River/rivers	1		

Seas – subcategories (6 %)

Data in percent		Data in percent	
Sea/ocean	3	North Sea/Baltic Sea	0.4
Tidal flats/Wadden Sea	2	Other comments	1
Beach/dunes	1		

Meadows/fields – subcategories (2 %)

Data in percent		Data in percent	
Meadows/flowering meadows	2	Field/fields	1

Other associations – subcategories (37 %)

Data in percent		Data in percent	
Species diversity/diversity/very diverse	8	Being careful/aware	1
Is an important topic	5	Organisations/associations/friends' associations	1
Specific organisations (NABU, WWF, Greenpeace, Peta, etc.)	3	Fire/fire safety/fires	1
Clean/cleanliness/no rubbish/plastic/waste avoidance	3	Foresters/forest/forestry sector	1
There are too few protected areas/there should be more	2	Demonstrations/Fridays for Future	1
Human beings	2	No outside intervention/by humans/in nature	1
No traffic/no cars	2	Agriculture	0.4
Environmentally friendly/environmentally conscious/sustainability	2	Other comments	14
No people/isolated	1	Unknown/nothing	2
Climate/climate zone/s	1	Don't know	1
Help/support	1		

A6.2 Protected areas are designated areas with the aim of preserving and developing nature and the landscape. Please specify whether you have heard the following terms before. (Figure 19)

Data in percent	I've heard of it and I know what the term means	I've heard of it but I don't know what the term means	I've never heard of it
Nature reserve	87	12	1
National park	70	26	4
Nature park	54	38	8
Biosphere reserve/area	14	42	44
Natura 2000	3	22	75

A6.3 How often do you purposefully visit the following protected areas? (Filter: Only respondents who answered, "I've heard of it and I know what the term means" for the respective protected area are asked this question.) (Figure 20)

Data in percent	Daily/every week	Monthly	At least once a year	Less than once a year	Don't know/no answer
Nature park	4	9	35	35	17
Nature reserve	5	13	27	37	18
Biosphere reserve/area	3	5	24	47	21
National park	2	3	26	50	19
Natura 2000	3	1	18	51	27

A6.4 What, in your opinion, are the most important objectives and tasks of protected areas? Please select three possibilities from the following selection. (Figure 21)

Data in percent	
Ensuring the biodiversity of animals and plants	74
Combating climate change/promoting adaptation to climate change	40
Allowing undisturbed landscape development	35
Allowing wilderness	32
Preserving beautiful landscapes	27
Safeguarding the basis for human existence (e.g. clean air and water)	27
Preserving homeland	15
Ensuring the protective function of the landscape (e.g. to protect against flooding or erosion)	15
Enabling recreation (e.g. sport, leisure)	9
Promoting ecological agriculture	9
Promoting environmentally friendly tourism	8
Supporting education and science	8

A6.5 We would like to know what information about protected areas is of particular interest to you. Please name the three most interesting pieces of information from the following list. (Figure 22)

Data in percent	
Protected animal and plant species	72
Protected habitats	44
Condition of the protected area (positive/negative developments)	34
Prohibitions and regulations in the protected area	30
Type of protection and development measures being implemented	26
Experience and recreational opportunities	22
Opportunities to get involved personally in the protected area	21
Origin and history of the protected area	17
Proximity and accessibility of protected areas near to place of residence	16
Refreshment options and trails	15

A6.6 We would like to know how you would like to be informed about protected areas. Please select three preferred options from the following selection. (Figure 23)

Data in percent	
Internet (websites, video platforms, etc.)	64
General educational institutions (schools, adult education centres, etc.)	61
Digital media (apps, QR codes, etc.)	51
Information available locally (information centre, information boards, etc.)	44
Television	41
Local guided tours	36

Chapter 7: Responsibility for and commitment to nature

A7.1 Who, in your opinion, should bear more responsibility for protecting nature in Germany in the future? (Figure 24)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all
Politicians	61	20	11	5	3
Environmental and nature conservation organisations	56	28	12	3	1
The agriculture and forestry sector	49	33	13	3	2
Citizens	49	31	15	3	2
Industry, trade, other economic bodies	45	28	17	6	4
Tourism sector	38	27	21	9	5
Churches and religious communities	16	21	27	25	11

A7.2 Please tell me whether you agree strongly, agree somewhat, partly agree/partly disagree, disagree somewhat, or do not agree at all with the following statements.

1) Collective effectiveness (Figure 25)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Don't know/no answer
I believe that we as humankind can work together to achieve something to protect nature on Earth.	59	25	9	3	1	3
My generation alone is not able to stop the destruction of nature politically.	26	28	24	13	5	4
Large demonstrations by people in my generation do something for nature conservation.	16	31	30	13	5	5

2) Personal effectiveness (Figure 25)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Don't know/no answer
I believe that I can achieve something to protect nature on Earth myself.	22	31	27	13	4	3
If I set a good example through my commitment to nature, it will also motivate others.	20	32	30	9	3	6
Getting involved in nature conservation often seems ineffective to me, so I don't even make the effort to achieve anything.	8	19	30	24	15	4

A7.3 How would you assess the commitment of your generation, that is to say young people of your age, to nature conservation? (Figure 26)

Data in percent	
Very strong	6
Quite strong	26
Average	34
Quite weak	24
Very weak	9
Don't know	1

A7.4 Have you ever heard of the following movements? (Multiple answers possible) (Figure 27)

Data in percent	
Fridays for Future	93
Atomkraft? Nein, danke!	59
Hambach Forest/Hambi bleibt	38
Ende Gelände	19
Extinction Rebellion	16
Wir haben es satt!	12

A7.5 Have you taken part yourself in demonstrations for nature and environmental conservation, for example Fridays for Future, Ende Gelände, or others? (Figure 28)

Data in percent	
Yes	33
No	64
Don't know	3

A7.6 Could you imagine taking part in demonstrations? (Only if the respondent has not yet taken part in a demonstration for nature and environmental conservation) (Figure 29)

Data in percent	
Yes	26
Maybe	39
No	31
Don't know	4

A7.7 How important do you think such movements are in achieving something for nature conservation? (Figure 30)

Data in percent	
Very important	32
Somewhat important	31
Indifferent	25
Somewhat unimportant	6
Completely unimportant	3
Don't know/no answer	3

A7.8 I am now going to read you some options on what you can do personally to protect biodiversity. How willing are you personally to ...? (Figure 32)

Data in percent	Very willing	Somewhat willing	Somewhat unwilling	Completely unwilling	Don't know/no answer
... go without single-use products?	49	35	11	3	2
... like the pages of nature and environmental conservation organisations on social media?	42	34	14	5	5
... switch brands of cosmetics or toiletries if you find out that their production is hazardous to the environment?	38	36	14	4	8
... make your friends and acquaintances aware of nature conservation?	34	43	15	4	4
... get involved in a clean-up campaign in nature with friends?	31	38	17	8	6
... limit your meat consumption or go without meat?	30	25	26	16	3
... pick up litter from the street?	24	40	23	7	6
... find out about current developments in the area of biodiversity?	24	42	22	6	6
... share articles about nature conservation on social media?	20	35	27	10	8
... pay attention to organic or fairtrade goods when choosing clothes/food?	17	38	30	8	7
... become actively involved in a nature conservation association?	10	27	36	18	9

Chapter 8: Energy transition

A8.1 Our daily life would be unimaginable without energy. We need it for heating, for road traffic, and for generating electricity. In Germany, the majority of energy is generated with fuels like coal, crude oil, and natural gas. Switching energy generation to solar, wind, and water power is known as the energy transition. These energy sources are also called renewable energies.

Do you think the energy transition towards predominantly renewable energies is the right way to go? (Figure 33)

Data in percent	
Yes	66
Undecided	21
No	2
Don't know/no answer	11

Chapter 9: Agro-genetic engineering and new genetic engineering processes in nature conservation

A9. **The genetic makeup of a living being is stored in building blocks called genes. You have a genetic makeup, too, which determines characteristics like your eye colour. Animals and plants also have a genetic makeup, which researchers can alter in a targeted way. They can, for example, isolate individual genes, separate them, or combine them in different ways. This procedure is called genetic engineering. It can give animals and plants characteristics that they didn't have before.**

How do you rate the following statements about genetic engineering. Do you agree strongly, agree somewhat, disagree somewhat, or not agree at all with the statements?

1) General attitudes towards genetic engineering (Figure 34)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/no answer
Humans shouldn't play God.	37	34	16	5	8
You shouldn't mess around with nature.	34	40	16	5	5
Genetic engineering is a great opportunity for achieving longer life and healing many diseases.	15	35	22	8	20
I think it's good that humans can use genetic engineering to influence the natural development and diversity of nature.	9	22	40	18	11

2) Attitudes towards the deployment of genetic engineering in agriculture (Figure 35)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/no answer
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	61	25	8	2	4
In my opinion, commerce should label foods made of animals that have been fed genetically engineered feed.	59	24	8	3	6
I don't think humans have the right to genetically modify plants and animals.	32	33	19	7	9
I think that genetic engineering in agriculture is an important building block in the struggle against world hunger.	15	32	27	10	16
I don't have a problem with eating genetically modified food.	9	27	31	22	11

Chapter 10: Digitalisation in nature conservation

A10.1 **Changes to the world by computers and the internet area called digitalisation. You can see digitalisation everywhere in your day-to-day life. Most devices and machines, like your laptop and your smartphone, are connected via the internet and can communicate with one another. This lets us message our friends (for example via WhatsApp), watch a video online (for example on YouTube), or find our way home using apps (for example Google Maps).**

Digitalisation is also an important issue for companies and banks. Many work steps are taken over by robots or take place via the internet. For example, many co-workers don't meet in person because they don't live in the same city or country. Instead, they work from their desk and talk to one another via the internet (for example via Skype).

What do you think about the following topics? (Figure 36 and Figure 37)

Data in percent	Many opportunities	More of an opportunity	Partly opportunities/ partly risk	More of a risk	Many risks	Don't know/ no answer
There is currently a lot of discussion about digitalisation. Some emphasise the opportunities, others the risks. How do you personally feel about it? Do you think that digitalisation provides more opportunities or poses more risks?	20	29	33	12	2	4
And if you now think about nature conservation: Do you think that digitalisation provides more opportunities or poses more risks?	8	23	37	23	4	5

A10.2 **To what extent do you agree with the following statements? (Figure 38)**

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
Nature conservation should try to make better use of the opportunities offered by digitalisation.	33	38	19	4	2	4
I can imagine myself using an app to find out about natural hazards, successes in nature conservation, or even possible actions that I could personally take.	24	33	21	14	5	3

List of footnotes

Footnote		Page
1	See www.bmu.de/ministerium/aufgaben-und-struktur/#c5912	6
2	See www.bfn.de/fileadmin/MDB/documents/leitbild_bfn.pdf	6
3	A direct comparison between the data from the youth study and the data from the adult studies on nature awareness is not exactly possible as was originally intended: The change in method from standard face-to-face verbal interview to an online survey due to the coronavirus lockdown and social distancing in early summer 2020, as well as the direct influence of the crisis on the response behaviour, represent unpredictable factors in a direct comparison. See also the Introduction chapter. An in-depth analysis of the comparison between adults and young people will be implemented in the scientific in-depth report on the studies from 2019/2020, which is planned to be published in the middle of 2021.	7
4	See https://theshiftproject.org/en/article/unsustainable-use-online-video und https://theshiftproject.org/en/article/shift-project-really-overestimate-carbon-footprint-video-analysis/	18
5	The share of daily internet users in the age group of 14 to 29 year olds is 98 percent (see the ARD/ZDF Online Study 2019), yet there remain certain groups, in particular young people with a low level of formal education, who are under-represented by this data collection method.	19
6	Methodologically, this is implemented by using non-directive narrative interviews, in which the young interviewees present all areas of life that are relevant from their point of view in their own language (see Calmbach et al. 2020, page 21 et seq.).	20
7	The indicator for young people's lifeworlds includes statements that represent the typical values of the individual lifestyles and thereby also make it possible to reconstruct the boundaries between the groups. As such, those statements that capture the basic beliefs of the respondents or that diagnose motives that are effective day to day have proved most effective. The criterion for selecting such statements is their power to differentiate, in other words, their suitability to optimally separate the different groups. On this basis, the respondents are assigned to the lifeworlds by means of a probability model using a specially adapted form of cluster analysis. This is done by determining a specific distribution of response probabilities across all indicator items (standard profiles) for each group. The lifestyle classification then occurs based on the similarity of the individual answer patterns with the probability model, according to the logic of the profile comparison.	20
8	Low – School type: Lower secondary school/technical secondary school (Hauptschule/Werkreal schule) or highest educational achievement: Lower secondary school-leaving certificate/technical secondary school-leaving certificate/no school-leaving certificate or school-leaving qualification aspired to by comprehensive school students: Secondary school-leaving certificate/technical secondary school-leaving certificate. Medium – School type: Intermediate secondary school (Realschule) or highest educational achievement: Intermediate secondary school-leaving certificate or school-leaving certificate aspired to by comprehensive school students: Intermediate secondary school-leaving certificate. High – School type: Grammar school (Gymnasium) or highest educational achievement: Upper secondary school-leaving certificate/general matriculation standard/specialist matriculation standard or school-leaving certificate aspired to by comprehensive school students: Upper secondary school-leaving certificate/general matriculation standard/specialist matriculation standard.	25

9 The BIK regions are a nationwide spatial classification system that represent city-surrounding area relationships at the municipal level for metropolitan areas, urban regions, mid-sized and sub-centres. There are two divisions of BIK region size classes, a system based on seven and ten figures. The classification used in the present study is based on the seven figure system, whereby three of the seven regional size classes were combined together for analysis of the data, as otherwise the case number of individual regional size classes would be too low with a sample size of around 1,000 respondents. The name "BIK" is derived from the "BIK Aschpurwis + Behrens GmbH" institute in Hamburg (for more information see www.bik-gmbh.de/cms/regionaldaten/bik-regionen). 25

10 See www.volksbegehren-artenvielfalt.de 36

11 The young people were given the following definition to read: In science, biodiversity is primarily understood to mean the diversity of genetic information and genes, secondly the diversity of animal and plant species, and thirdly the diversity of habitats and ecosystems. 37

12 Trees are essentially flowering plants (spermatophytes). The blossoms of angiosperms – such as the cherry blossom – are obvious. The blossoms of gymnosperms (such as pine, fir trees) are less obvious and these are therefore often not considered to be flowering plants in the narrower sense. "Tree" denotes a growth habit (in addition to shrub, semi-shrub, herb, etc.). Trees were offered for selection as an independent category due to their great importance for the ways in which humans experience nature. 41

13 The percentages of the categories (such as the "Landscape/nature" category) are not obtained by adding the sub-categories (such as "Nature/environment", "Forest/forests"), as the young people were able to give multiple responses in the free answer format. Sub-categories are named as examples in the text and are listed in detail in the basic count. 44

14 Natura 2000 cannot be analysed further (three percent of n = 1,003 young people). 47

15 Strictly speaking, "Nein danke!" is not a movement but a logo, but we felt it was too great a risk that the more accurate name "Anti-Atomkraft-Bewegung" (anti-nuclear movement) would not find resonance in particular in the younger age group 54

16 Knoblich (2020) developed a didactic method focusing on biodiversity for biology lessons in extracurricular settings using smartphones, which enables bio-based GPS tours ("Biotracks") with a smartphone. The project has shown that biotracks can have a positive impact on the environmental education, in particular attitudes towards the environment, knowledge about the environment and environmental actions of the learners. In the "Biodiversity to go (BioDiv-2Go)" project, biodiversity was made accessible using contemporary technologies, such as mobile electronic terminals (smartphone, tablet, mobile phone, GPS receiver, etc.). Location-based games, so-called geogames, were used as a method. These combine play and movement in the space and therefore link the concepts of experimental learning, learning outside in nature and exploratory research-based learning (see Lude et al. 2020). The "Stadtnatur entdecken" (Discover urban nature) project supported by the BMU is intended to help strengthen the focus on nature in urban environments and communicate environmental education digitally. With the "Naturblick" app, young adults are encouraged to explore nature in Berlin. 71