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2019 Nature Awareness Study

Population survey on nature and biological diversity

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2019 Nature Awareness Study

Population survey on nature and biological diversity

“Nature Awareness in Germany” is a study that the Federal Ministry for the Environment and the Federal Agency for Nature Conservation publish jointly every two years (F+E project, grant number 3518850100).

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 analysis) and Ipsos GmbH (survey implementation), as well as technical support from Federal Ministry for the Environment (BMU, Mira Nürnberg) and the Federal Agency for Nature Conservation (BfN, Dr Andreas Wilhelm Mues).

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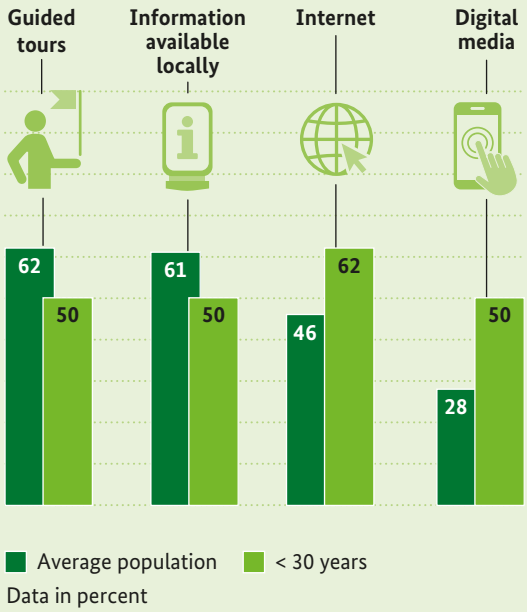
Key statements and recommendations

Protected areas – great importance for people and nature

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



The topic of "protected areas" is currently very high on the political agenda: In May 2020, the EU Commission published its 2030 biodiversity strategy, which envisages a comprehensive expansion of the European protected areas. By the year 2030, 30 percent of the EU's land and sea area should be legally protected. The member states are called upon to implement these measures accordingly.

Key statements:

- The vast majority of the population agree that protected areas are important for preserving nature for future generations (93 of respondents).
- 77 percent of respondents agree that protected areas are an important part of their homeland.
- The most commonly known protected categories among respondents were nature reserves (89 percent), bird sanctuaries (87 percent) and national parks (76 percent). Only seven percent were aware of Natura 2000, the European Union's protected areas network.
- A large majority of 72 percent of respondents would like to be informed about the protected animal and plant species in protected areas. In addition, an interest in information regarding protected habitats (46 percent) and the condition of the protected area (31 percent) was expressed.
- Information about protected areas is primarily desired in classic formats locally, that is through guided tours (62 percent of respondents) or through information provided in the protected area (61 percent). The desire for more information via the internet, for example through the use of websites or video platforms (62 percent; population average: 46 percent) and the desire for more digital options such as apps or QR codes (50 percent; population average: 28 percent) was very pronounced among those under 30.

Recommendations:

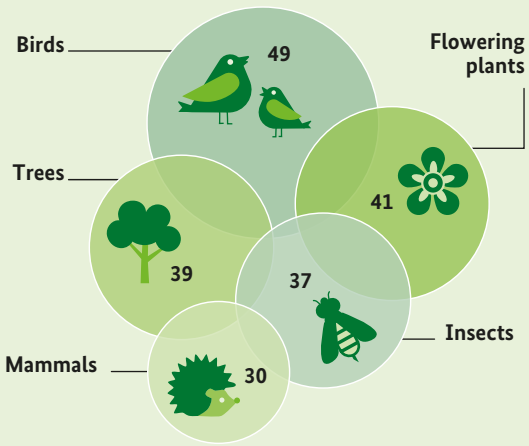
The latest nature awareness study shows that the expansion of protected areas has strong support from the population: 72 percent of respondents are fully or at least more in favour of Germany being more politically committed to maintaining and expanding international protected area networks. This support can also be transferred to the protected area objectives of the EU 2030 biodiversity strategy and suggests that the implementation of these objectives can expect wide support from the population.

Protected areas are seen as important elements of the regional identity, whereby the population should be made more aware of the existing **European and international protected area awards and agreements** and these should be used more widely in nature conservation communication. In particular, the Natura 2000 European network should be used to a greater extent to make Europe's contribution to nature conservation more visible.

Another task is to **communicate the variety of objectives and tasks of protected areas more effectively** in the future. The results of the 2019 Nature Awareness Study show that the public have become widely aware of the protection aspect in particular; for example, an overwhelming majority of respondents (68 percent) highlight the protection of the biodiversity of animals and plant as an important task. However, only ten percent of respondents said that protected areas should promote ecological agriculture or should allow recreation and environmentally friendly tourism. The fact that protected areas also serve to secure human livelihoods (named by 29 percent of respondents) and provide human beings with various wellbeing effects should therefore be communicated more strongly: The impression that protected areas are reserved exclusively for nature and that human beings must stay out needs to be counteracted as a matter of urgency. After all, 21 percent of respondents assign protected areas the important task of counteracting future climate change.

Species knowledge – get to know nature

Please select three species groups that you would like to know more about.



Data in percent

You can only value what you know and can name: The dramatic figures showing the decline in insects in Germany have affected many people and (re)awakened their interest in the local diversity of animals and plants. This can provide an opportunity to counteract the "dying out of experts" in the field of species knowledge.

Key statements:

- The desire for better knowledge about animal and plant species is widespread among the population.
- There are clear trends as to which species groups the population would like to know more about. The top 5: Birds (49 percent), flowering plants in general (41 percent), trees more specifically (39 percent), insects (37 percent) and mammals (30 percent).
- With regard to learning locations, offers and opportunities for imparting knowledge about types of species, more "classic" options are very popular. 44 percent of respondents would like guided nature tours.
- Preferences for learning opportunities are influenced by factors such as age: Younger respondents are far more likely to want information about species to be shared via the internet and digital media such as apps and QR codes. Television is an important source of information, particularly for older people.

Recommendations:

Public opinion shows that people would like to have **direct contact with nature** in order **to acquire knowledge about species**. This desire to experience and communicate via "classic formats" such as nature tours could provide important impulses to counteract the erosion of species knowledge by involving participants in this area of education.

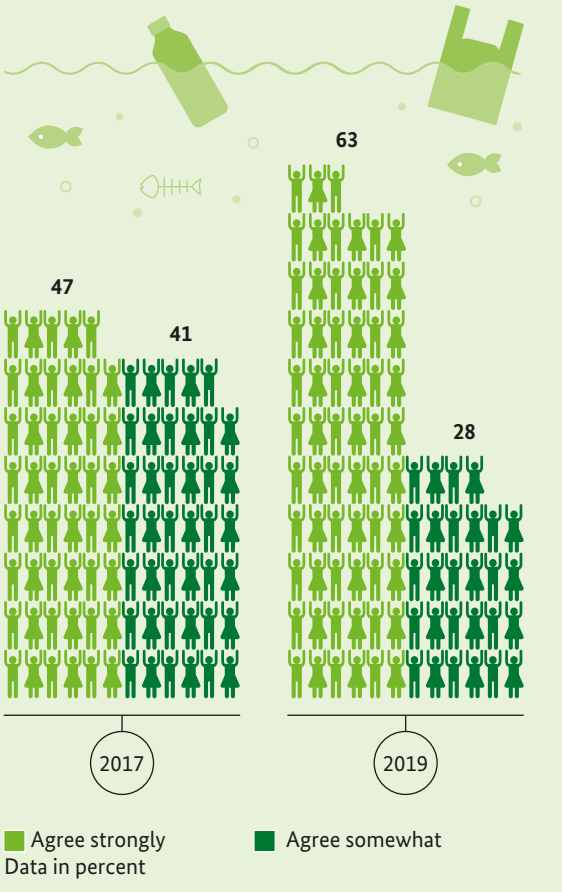
Furthermore, the **differences between the generations** are interesting: The youngest surveyed segment of those under 30 does not differ from the general population with regard to their basic interest in species knowledge, but does ascribe itself a significantly lower level of knowledge about animals and plants. At the same time, their strong preference for digital media such as apps, QR codes and websites indicates the direction that should be taken in order to more successfully address specific offers to young people. It would, for example, be advisable to promote identification apps that already exist and to increase awareness of them among the population. More

courage is required to rely even more heavily on new communication channels such as social media and to check their suitability for relaying information about species.

It should also be emphasised that the respondents clearly refer to the **educational task of schools** in increasing knowledge of species. Here it is important to involve the topic of species knowledge in the country-specific coordination processes for school curricula, to develop suitable teaching materials, and to make teaching mandatory within the framework of the syllabus, for example, in collaboration with teaching associations. Another aspect is to reverse the erasure of life science courses focusing on organisms in the **higher education system**, and to make funds available for the establishment of specific departments and institutes.

The connection between humans and nature – a contradictory relationship

It angers me that so many people treat nature so recklessly.



Like its predecessor studies, the 2019 Nature Awareness Study shows that nature is a precious asset to people in Germany. The majority of them want to campaign to protect and preserve it for future generations. However, there is still a large gap between having a positive attitude towards nature and protection, and taking corresponding individual action.

Key statements:

- 91 percent of Germans are considerably or at least slightly angered that many people are careless with nature. The number of those who are very angered has significantly increased over the last two years: In 2017 it was 47 percent, while in 2019 it is 63 percent.
- The preference for "wild" nature has significantly increased since 2015. 75 percent of the 2019 respondents approved of this. In 2015 this was 54 percent.
- In 2019, one in four respondents think that nature should not stand in the way of economic development. In 2017, just under a third of respondents were of this opinion: Economic development at the expense of nature therefore has significantly fewer advocates.
- 93 percent of respondents agree with the statement that nature conservation is necessary in order to meet the challenges of climate change.

Recommendations:

One of the most striking results of the study is that more and more people are angered by the careless handling of nature and want nature to be "wilder". At the same time, respondents give less and less priority to economic interests. This should be used as an opportunity to stress the development of new concepts with economic and industrial stakeholders and to work on more environmentally friendly economic situations.

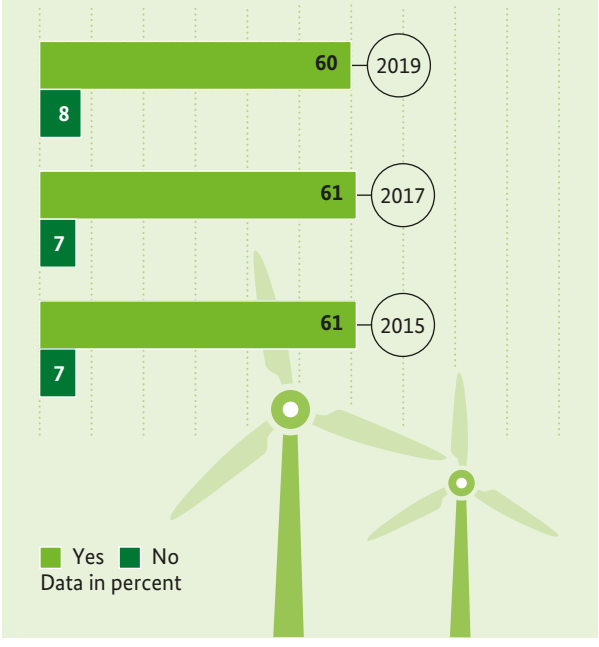
The **connection between nature conservation and climate change**, which is seen by many people, should encourage those involved in nature conservation **to think about and communicate these two policy areas together more consistently**.

Overall, however, the relationship between human beings and nature is a paradoxical one: This is particularly clear from the fact that members of the higher class milieus regularly express a significantly higher awareness of nature than members of the middle class or more socially weaker milieus. In contrast to these, socially better-off groups also have a significantly worse ecological balance and a more resource-intensive lifestyle (for example due to their energy consumption, long-distance travel, etc.). Conservation communication must address this rift directly: **Socially higher milieus must be shown the lack of a match between their convictions, actions and lifestyles**, and they should also **take greater responsibility**.

Less socially advantaged milieus can also be addressed through nature conservation communication and proposals. According to the latest research results (Frohn et al. 2020)[1], socially weaker groups have heretofore been insufficiently addressed by nature conservation messages and educational work. However, there is wide demand for nature experiences, even if it is not verbalised in the vocabulary of nature conservation.

Renewable energies – on the way to a community project

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



The energy and climate policy debate had a significant impact on Germany in 2019, and this policy area will continue to play a key role in the government's planned economic stimulus programmes in 2020. Against this background, the trends in the population's attitude towards the implementation of the energy transition are of particular interest.

Key statements:

- Approval for the energy transition in Germany is high and has remained stable for years: 60 percent of the population are clearly in favour of this in 2019 (2017 and 2015: both 61 percent); only a minority of eight percent is against it (2017 and 2015: both seven percent).
- 75 percent of respondents are of the opinion that the energy transition is necessary in order to combat climate change.
- Of the potential technologies for bringing about the energy transition, solar panels on buildings come out on top by a significant margin.

Recommendations:

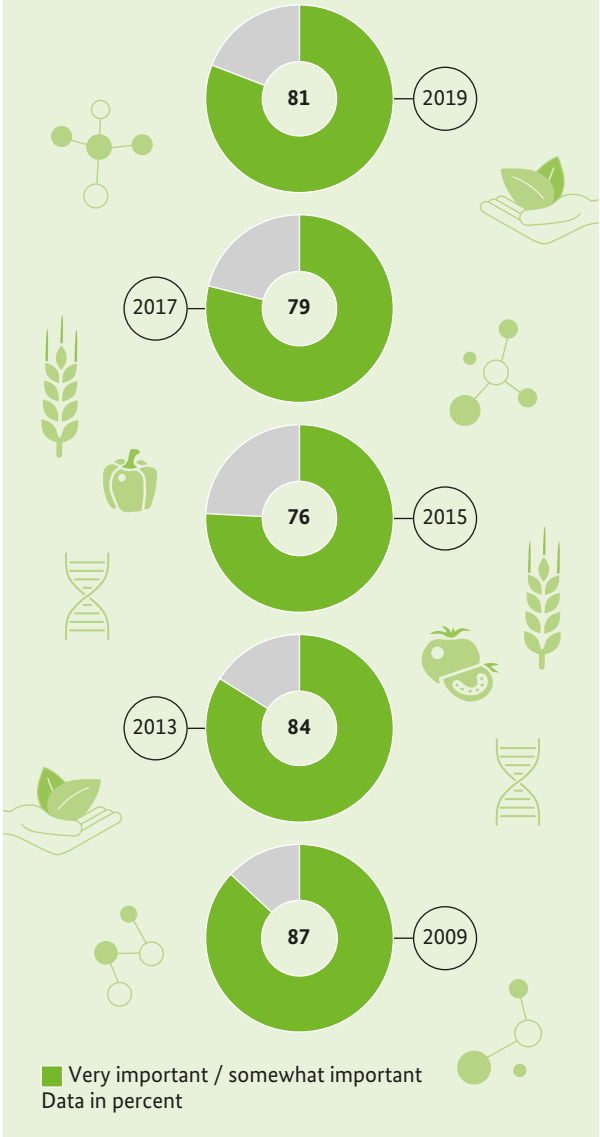
It is worth highlighting that socially weaker milieus are less sceptical than before, while socially higher milieus are slightly less euphoric about the issue. This "de-polarisation" of the topic is a positive signal that society is moving towards a common denominator when it comes to the question of the transformation of the energy sector.

Implementation of the energy transition is **no longer a question of meaningfulness or of "why?" but of "how?"**. In the case of implementation at a local level, it can therefore be helpful to make the overriding meaningfulness of the energy transition clear by **communicating about the key topic of "climate change"**. The contribution towards climate protection and the positive indirect effects of the expansion of renewable energy generation on nature conservation should also be communicated more clearly, as should the nature conservation success stories that have already been achieved. However, unavoidable adverse effects must also be clearly stated for transparency purposes (see Hübner et al. 2020[2], Wachholz 2020[3]).

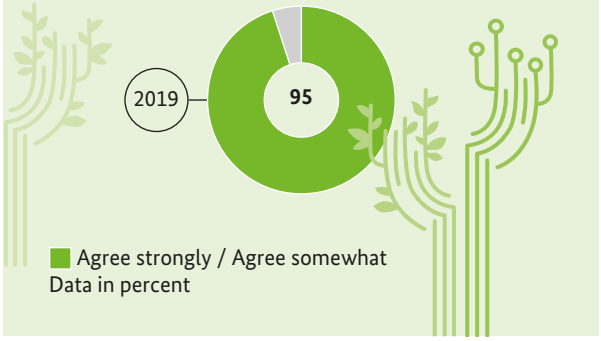
The 2019 Nature Awareness Study shows which **measures for implementing** the energy transition are particularly favoured: 58 percent of the population think it a good idea to install solar panels on buildings. This is a full 21 percent more than the second best measure - wind turbines at sea. Solar panels on buildings were included in the established canon of measures for the first time in 2019. The enormous level of approval for this alternative clearly indicates a direction: The technical implementation of the energy transition in nature areas is less desirable than the **use of artificial structures and surfaces that are already in use**.

New genetic engineering processes – challenges for nature and nature conservation

The use of genetically modified organisms in farming will be banned.



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



In the rapidly expanding field of agro-genetic engineering, advances, especially in bioinformatics and laboratory automation, are opening up significantly more efficient manufacturing processes for genetically modified organisms. The CRISPR/Cas gene scissors technique and other genome editing methods have contributed significantly to this development. The leading decision of the European Court of Justice from 25th July 2018, according to which organisms produced or modified by gene editing are considered to be genetically modified organisms within the meaning of genetic engineering law, continues to be discussed intensively.

For nature conservation, the so-called new genetic engineering processes and their potential use in and for nature conservation represent a challenge in terms of the conceptual questions and environmental risk assessment.

Key statements:

- A clear majority of 81 percent of respondents supported a ban on the use of genetically modified organisms in agriculture in 2019. This clear positioning has been noticeable for many years (2017: 79 percent; 2015: 76 percent; 2013: 84 percent; 2009: 87 percent).
- 95 percent are in favour of labelling foods made of animals that have been fed genetically modified feed. The clear positioning of the population in this regard has increased significantly over the last two years.

- Concerns about eating genetically modified foods have also increased: In 2019, only 22 percent stated that they had absolutely no or at least little problem with it in principle, whereas in 2017 this was 31 percent.
- New genetic engineering processes such as genome editing (for example the CRISPR/Cas gene scissors) make the targeted modification of genetic material easier. 88 percent of respondents are of the opinion that the long-term consequences of these new processes cannot yet be foreseen.
- A very clear majority of 95 percent of respondents are of the opinion that the possible impact on nature must always be investigated when plants are genetically modified using new processes.

Recommendations:

The public's continued support for a **ban on genetically modified organisms in agriculture** is a clear signal to the government that it should continue to advocate its freedom of choice, even in the event of EU-wide approvals, to prohibit cultivation in Germany. The European Union allows member states to adopt national cultivation bans, however this EU directive has not yet been implemented as national law. The stable opinion of the population helps to emphatically pursue corresponding efforts.

Transparency and freedom of choice remain key terms for consumers in the context of genetic engineering in food production, as shown by the clear rejection of the consumption of genetically modified food and the increased demand for compulsory labelling. According to EU law, foodstuffs are only required to be labelled if the proportion of genetically modified ingredients are over 0.9 percent. Animal products such as meat, milk and eggs that were produced using genetically modified feed do not require labelling at all. However, the percentage of genetically modified feed is not negligible, with the EU and Germany importing around 35 million tonnes per year.[4] Against this background, the opinion of the population is a more than clear mandate for the government to make further regulations.

The response behaviour of the respondents to the **new genetic engineering processes (genome editing)** shows a high level of scepticism. Surprisingly, only a minority of the respondents expressed a clear confidence in the statements by scientists that the new genetic engineering processes are safe (only eight percent fully agreed, another 28 percent "agree somewhat"). A clear majority of respondents (88 percent) are also of the opinion that the long-term consequences of these new processes cannot yet be foreseen, which emphasises the importance of the **precautionary principle**[5]. A full 95 percent are in favour of the potential effects on changes in plants caused by new genetic engineering processes being continually examined – a continuation and, if necessary, a possible extension of the already legally approved **environmental risk assessment** for corresponding genetically modified plants is therefore advisable.

In addition, it is important that politics and business **take the ethical concerns of the population seriously**. A large majority of 84 percent of respondents are of the opinion that humans have no right to genetically modify animals and plants. The targeted genetic modification of animals and plants from the wild is also not approved of: A total of 90 percent reject such measures.

Digitisation – opportunities for nature conservation

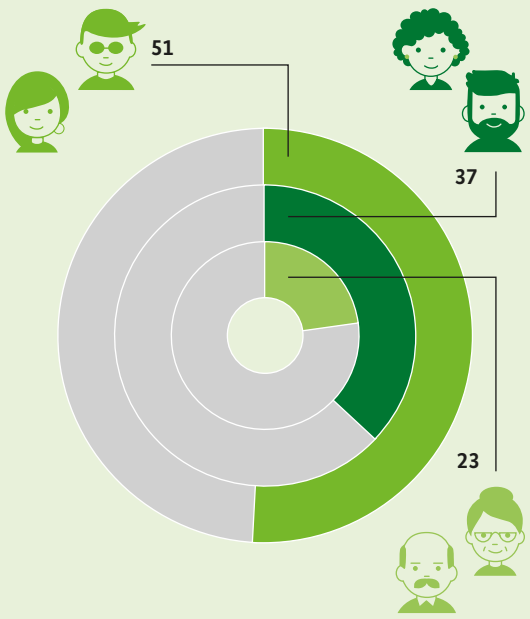
In its 2019 digitisation strategy, the government defined five overarching operational objectives that Germany intends to use to shape its digital transformation. In its environmental Digital Policy Agenda (2020), the Federal Ministry for the Environment defines strategic goals for using digitisation to help nature, the environment and climate. In addition to the opportunities, this also looks at the negative consequences of digitisation, such as the mining of rare raw materials, energy consumption, and social control. The use of digital media and processes are also on the rise in the field of nature conservation.

Key statements:

- 37 percent of respondents see opportunities for nature conservation in digitisation. However, the group of undecided is almost equally as large (partly agree/partly disagree: 36 percent), and almost one in five focus on the risks.

- The perception of the opportunities for nature conservation provided by digitisation is very clearly an age issue: 51 percent of the 18 to 29-year-olds see opportunities, compared to only 23 percent of over 65-year-olds.
- An average of 44 percent of respondents could imagine being informed about nature conservation and their personal options for action via an app. Here, too, the approval rate in the youngest segment surveyed of 18 to 29-year-olds is 59 percent and significantly higher than the average.

And if you now think about nature conservation: Do you think that digitisation provides more opportunities or poses more risks?



Recommendations:

Digitalisation is a generational issue. It is very popular with younger people, while older respondents show more concern about it. In order to make greater use of the opportunities digitisation offers nature conservation and sustainability, it makes sense to **focus measures and communication on younger and older groups**.

Communication campaigns in the context of digitisation and nature conservation could, for example, be geared more towards a younger audience and be designed to suit the target group. "Gamification" (that is the introduction of game-like aspects into an otherwise serious context) could be used to make specific tools (for example apps for species identification and nature observation) even more interesting to younger people during their free time. It is also important to **make older groups more familiar with the technical opportunities** and, in particular, to take their concerns seriously:

Fundamentally, a **social discourse is required** on how far digitisation should and may find its way into the lifestyles and economic lives of individuals and society as a whole – also taking into account the aspects of nature and environmental protection. For nature conservation projects in natural environments, for example, it is important to consider the cost-benefit ratio of better data acquisition and provision in the landscape conservation, or in the context of more eco-friendly agriculture, the increasing energy demands for transmitting increasing amounts of data.

Biodiversity – spirit of optimism: Attitudes and behavioural willingness have markedly increased

The National Strategy on Biodiversity (2007) contains a set of indicators that are intended to ensure comprehensive monitoring of target achievement. The so-called "social indicators" calculate the population's awareness of biodiversity and have been recorded as part of the nature awareness studies since 2009. They are made up of the sub-areas, "knowledge", "attitude" and "willingness to act".

Key statements:

- For the first time since recording began in 2009, the 2019 Nature Awareness Study shows a significant increase in the "awareness of biodiversity" overall indicator: Sufficient knowledge, consistent attitudes and sufficient willingness to act were shown by 28 percent of the population in 2019 compared to just 22 percent in 2009. Compared to the last survey, the average population showed a significant

increase in their expressed behavioural willingness (2019: 63 percent; 2017: 56 percent) and in their attitude (2019: 60 percent; 2017: 54 percent).

- It should be particularly emphasised that the expressed behavioural willingness in under-30s has increased sharply from 2017 (48 percent) to 2019 (65 percent).
- The percentage of those who are very convinced of decline in biodiversity has increased continuously in recent years (2015: 26 percent; 2017: 36 percent; 2019: 43 percent).
- In 2019, 90 percent of respondents perceived climate change as a threat to biodiversity.

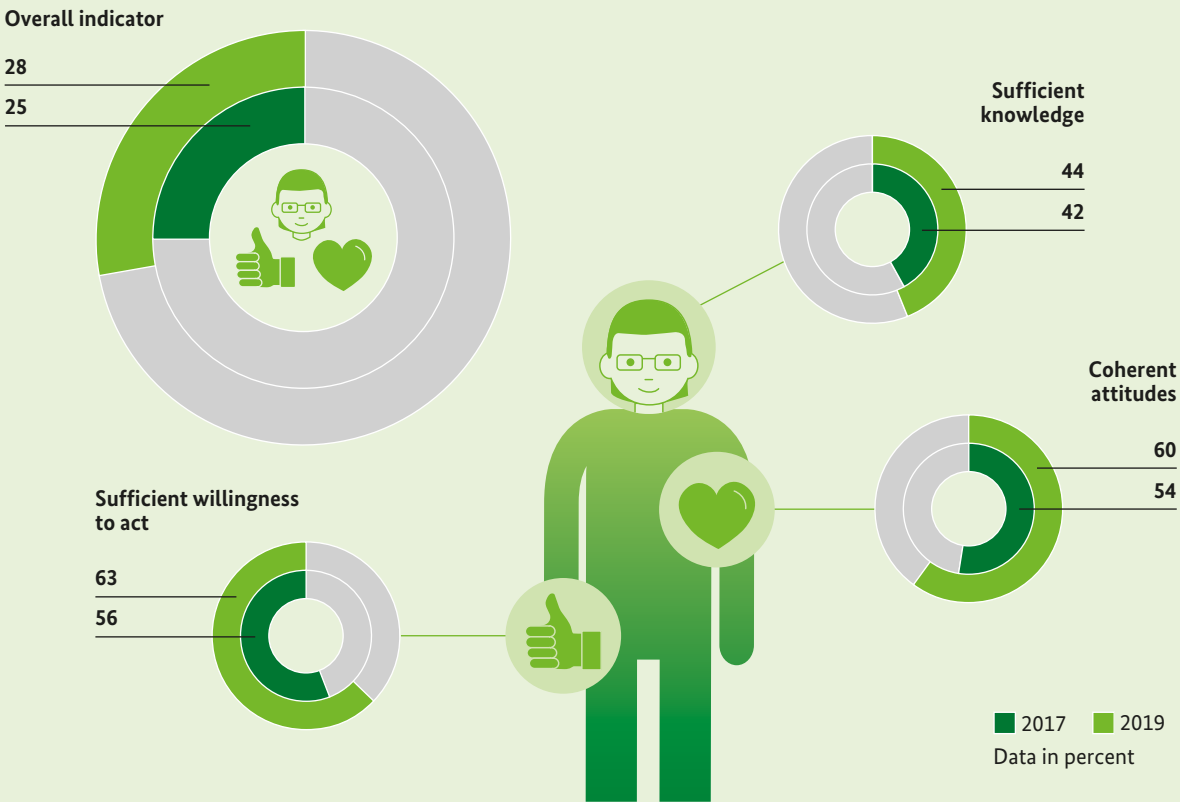
Recommendations:

The population's awareness of biodiversity has **developed positively in recent years**. Significant gains can be observed in the "attitude" and "behavioural willingness" sub-indicators. Continuation of communication activities is required to continue this positive trend.

Societal awareness of biodiversity has undergone particular development since the last survey in 2017. It is reasonable to assume that the current political and societal discourse on nature, environmental and climate protection issues with frequent media coverage of topics such as international climate policy, insect decline and the appearance of strong youth movements, particularly Fridays for Future, have played an important role.

For the target-oriented design of nature conservation communication, this means **picking up on positive partial developments and driving them forwards: Attitudes** can be challenged through public discussions and communication measures, made visible and promoted through a democratic debate. **Behavioural willingness** should be encouraged in communication work through the development and media dissemination of specific options for taking action, as well as through proposals for accompanying implementation. The heretofore strongly pronounced **focus of communication work on the knowledge of concepts must**

Measuring tool:
Awareness of biodiversity



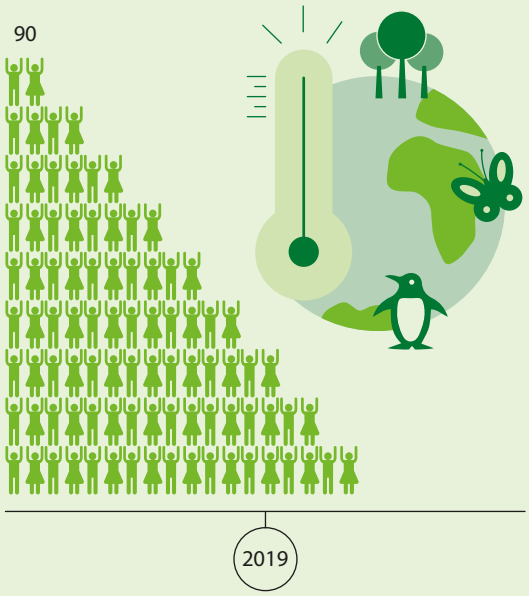
be put to the test. Numerous psychological studies show that there is only a minor correlation between abstract knowledge and specific behaviour.

The analysis of the development of awareness of biodiversity between 2017 and 2019 also reveals two other trends: The topic of biodiversity has **reached the centre of society** and is also noticeably **promoted by positive developments in the youngest survey segment**.

The subject of the **(re)orientation of nature conservation communication** should therefore particularly **continue to support young people in their commitment to nature and environmental conservation**. This not only means relying on social media and digital formats for target group-specific communication. It also means looking at the strong leisure and "event" orientation of young people as a characteristic that has not yet been taken into account when planning communication campaigns to protect biodiversity.

In addition, nature conservation communication should be more **connected to ongoing discourses** that young people are having, for example by categorising the **loss of biodiversity within the larger context of the climate discussion**. The fact that this connection is very promising is shown by the response behaviour of the respondents to the newly included question on climate change. Of all the attitudes surveyed regarding biodiversity, the climate problem received the highest rating: More than half of all respondents feel that climate change is a clear threat to biodiversity.

Climate change threatens biodiversity.



Agree strongly / Agree somewhat
Data in percent

1 Introduction

The present study is a representative population survey on nature awareness in Germany. Nature awareness studies have been conducted and published every two years since 2009 on behalf of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Federal Agency for Nature Conservation (BfN).

The nature awareness study provides information on how the population perceives and experiences nature, supports its conservation, and how they assess the current issues of nature conservation policy. As a monitor of social trends, it provides empirically verified data, which represent important foundations for nature conservation policy, public discourse and educational work.

This study is based on the German-speaking resident population 18 years of age and older. For the survey, 2,044 people were interviewed in computer-aided face-to-face interviews (CAPI). The study was designed by Dr Christoph Schleer and Naima Wisniewski from SINUS Market and Social Research GmbH, Dr habil. Fritz Reusswig of the Potsdam Institute for Climate Impact Research (PIK) and the specialist support of the BMU and BfN. The data collection was carried out in autumn 2019 by Ipsos GmbH. When interpreting the data, the project team was advised by a working group of experts, including: Prof. Dr Sebastian Bamberg (Bielefeld University of Applied Sciences), Prof. Dr Stefanie Engel (University of Osnabrück), Dr Uta Eser (Büro für Umweltethik, Tübingen), Prof. Dr Immo Fritsche (University of Leipzig), Prof. Dr Ulrich Gebhard (University of Hamburg) and Prof. Dr Jörg Lindenmeier (University of Freiburg).

A final scientific report with in-depth analyses of the survey results is planned for 2021. As with the previous nature awareness studies, the data set with all survey results will be made available to the scientific research community as an SPSS file via the data archive for the social sciences at the GESIS Leibniz Institute upon completion of the research project.

This brochure as well as the previous studies and the respective in-depth reports can be downloaded from the BfN website (www.bfn.de/naturbewusstsein.html). The English version of the basic data brochure will be available for download at the end of 2020 at: www.bfn.de/nature-awareness-study.html

1.1 Objectives and concept

The nature awareness study is a tool for the continuous monitoring of the social awareness of nature, nature conservation and biodiversity. The surveys on nature awareness are set out as a concrete operational objective in the "National Strategy on Biodiversity" (NBS). The study provides the data needed to calculate the indicator on the "importance of environmental objectives and tasks" set forth in NBS reporting requirements (the so-called "social indicator"). Furthermore, substantial indications for nature conservation policy, general and target group-specific nature conservation communication and educational work are to be derived from the findings of the study.

The nature awareness study consists on the one hand of a basic framework of questions that remain unchanged in order to uncover social trends in nature awareness. On the other hand, every study looks at new subject areas that are linked to current discussions and nature policy work.

The focus of the 2019 Nature Awareness Study is "protected areas". Although the tasks of nature conservation are not limited to these places, protected areas are a central sphere of activity for nature conservation work and are at the centre of public awareness. Here, one can get a sense of what nature conservation means and what nature conservation "does": It protects plants, animals and habitats from intensive human exploitation. But what exactly do people know about protected areas? Do they know the different categories of protected areas and can they differentiate between them? Are they familiar with the diverse goals of the types of protected areas? And: How do they rate area-based nature conservation? What does it mean for their own lives, and for their regional anchoring?

In addition to the main topic of "protected areas", the 2019 Nature Awareness Study also deals for the first time with the topics of "species knowledge" and "digitisation". The issue of species decline has recently gained public attention. Referendums and media attention made the issue of "bee or insect decline" an increasingly recognised topic in the political sphere. Does this increase in importance correspond with an increased knowledge of species? How do people rate their knowledge of species and where does this knowledge come from?

If these new questions in the nature awareness study touch on more traditional core topics of nature conservation, the topic of "digitisation" clearly points to the future. It plays an increasingly important role in almost all areas of life, including in nature conservation. This study is the first to address this topic.

The topics of "the connection between humans and nature", "social awareness of biodiversity", "attitudes towards genetic engineering" and "acceptance of the energy transition" from the previous studies are continued and have been partially expanded upon:

The subject area of "the connection between humans and nature" encompasses the core of social nature awareness, which is mapped out in its content, characteristics and changes over time. Questions are asked about the understanding of the term "nature", about personal appreciation of nature, the assessment of natural hazards and about different attitudes towards the conservation and exploitation of nature. The range of topics on biodiversity is an integral part of every nature awareness study. The study measures the social awareness of the importance of biodiversity and thus the so-called "social indicator" of the National Strategy on biodiversity (NBS) based on questions pertaining to knowledge, attitude and behaviour. The attitudes of the population to genetic engineering in agriculture were already queried in 2009 and 2013. In 2015 and 2017 further questions were added, which were repeated again in 2019 and supplemented with questions on new genetic engineering processes. The questions of the social acceptance of the energy transition and its effects of nature and the landscape were first included in the questionnaire of the nature awareness study in 2011, and have been continued since.

1.2 Introduction to the Sinus milieus

How people personally perceive, use and value nature not only depends on how old they are or their level of education. In addition to socio-demographic characteristics, it is primarily value orientations and lifestyles that determine individual attitudes, behavioural patterns and approaches to nature.

Since 2009, the socio-cultural approach of the target group model of the Sinus milieu has been integrated into the research design of the nature awareness study. Through the differentiated evaluation of the data according to the milieu affiliation of the respondents, the socio-demographic analysis is supplemented by lifestyle and value components.

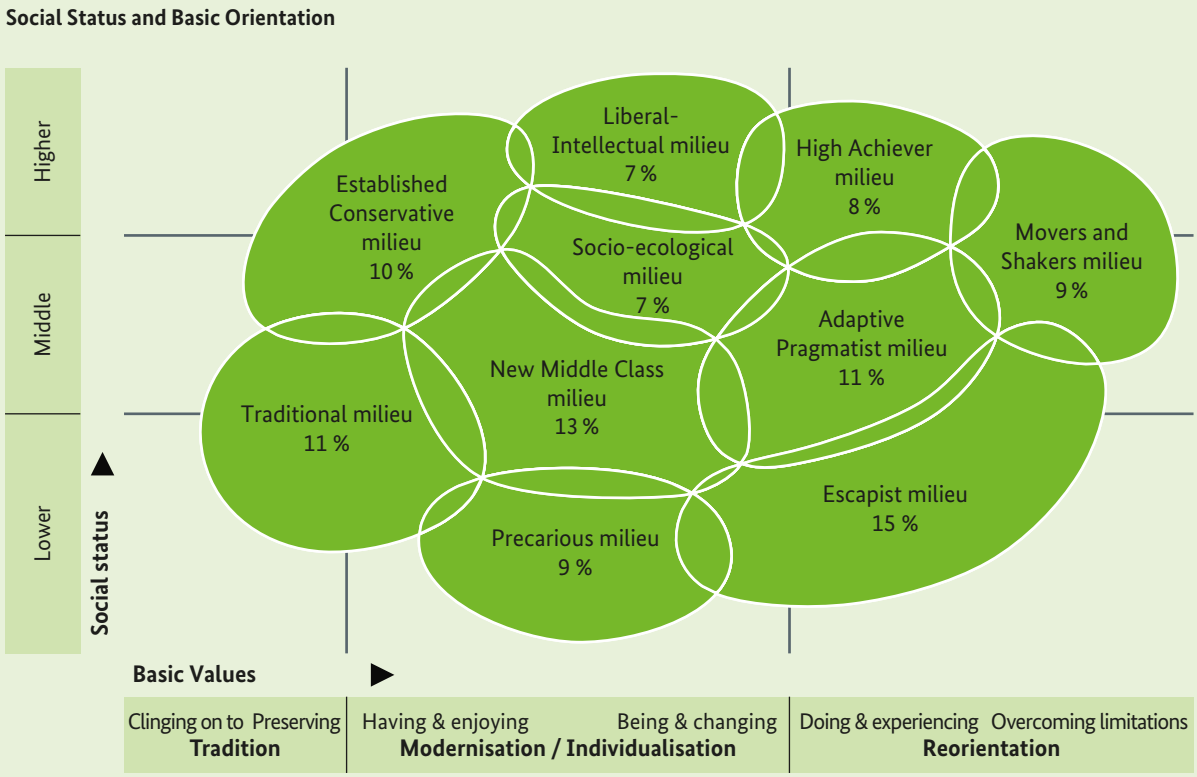
The Sinus milieu is a scientifically based social model. In contrast to traditional stratification and lifestyle models, the following is classified in a socio-cultural way: Basic values that determine lifestyle and life goals are considered, as are attitudes towards everyday life, for example work, family, leisure and consumption. Sinus milieus do not refer to partial aspects of everyday reality, as does the usual lifestyle typology, but instead bring the human being and the entire frame of reference of his lifeworld holistically into focus.[6]

By including the Sinus milieu indicator[7] into the design of the nature awareness study questionnaire, the members of the various milieus can be quantitatively mapped to the adult population. It thereby becomes clear that the individual lifeworlds represent different proportions of the population (see Figure 1).

The Sinus model for Germany 2019 consists of ten different social milieus. The milieus are situated in a plane that is spanned by two axes; the basic socio-cultural orientation, and the social situation. The higher a milieu is located in this graph, the more upscale its social class (in terms of characteristics such as education, income or occupational group)[8]; the further to the right it is situated, the more modern is its basic orientation in a socio-cultural sense. The fact that the boundaries between the milieus are fluid is taken into account. It is in the nature of social reality that lifeworlds cannot be restricted as (supposedly) precisely – according to income or educational level obtained for example, as social classes. SINUS calls this the "uncertainty principle of everyday reality". This is a fundamental part of the milieu concept: There are points of contact and transitions between the different lifeworlds. Only then is it possible to speak of a life-like model.

The short profiles of the Sinus milieus and nature awareness in the lifeworlds are presented below.

Figure 1: The Sinus-Milieus in Germany 2019



Socially elevated milieus

The Established Conservative milieu represents the classic establishment. The preservation of proven traditions and ways of life is a central concern of the members of this milieu. On the other hand, they reject postmodern arbitrariness and a hedonistic experience orientation. The self-image of those in the Established Conservative milieu is that of a responsible social elite. Achievement coupled with the postulate of individual responsibility is its guiding credo. They are very interested in society, politics and the church, are relatively strongly socially engaged and demand a say in decision-making. Many claim social opinion leadership.

In the Established Conservative milieu, nature is associated with creation. Nature is valued because it is fundamental to human existence. Nature as a cultural asset fulfils an important function for those in the Established Conservative milieu, as well as a possibility for identification with one's own homeland. Many members of this milieu are concerned about the loss of biodiversity, especially if native species and traditional cultural landscapes are the focus, as this will cause a piece of history and culture to be lost. Since their self-image corresponds to that of a responsible social elite, they see it as a duty and a virtue to leave nature intact for future generations. They are thereby willing to lead the way to set a good example.

Socio-demographic characteristics:

- Milieu of the middle-aged to advanced aged: Age concentration over 50 years of age, average: 54 years of age.
- Average to higher education levels.
- Very often married; children who often do not live at home any more.
- Senior and qualified employees, senior civil servants; well situated, higher income.

The Liberal-Intellectual milieu is the enlightened educated elite with a liberal, cosmopolitan attitude, post-material roots and the pursuit of a self-determined life. The world view of this mostly well-situated milieu is based on global thinking and distance from ideologies of any kind. It perceives the increase in complexity in a global world as a challenge and affirms cultural pluralism. What is typical is the need for intellectual stimulation through art, music

and culture. Liberal-Intellectuals accept competitive society, but also perceive themselves as having a duty to contribute to a better and more just world.

Nature plays an important role in life for Liberal-Intellectuals. Above all, it serves to compensate for the demanding daily work routine. A conscious stay in nature helps them to find a work-life balance; the right balance between work, private life and relaxation. Due to their proximity to nature and their knowledge of the hazards posed to nature, they are sensitised to the protection of nature and the environment to a high degree. They are aware that man is dependent on nature and that damage to nature also affects humans. So they know about the decline of the biodiversity and are willing to take responsibility for the conservation of nature.

Socio-demographic characteristics:

- Middle age groups: Age concentration 40 to 60 years of age, average: 50 years of age.
- High level of formal education; many with academic degrees.
- Often married; with children in the household.
- Disproportionately often fully employed; above-average number of self-employed, also many qualified and senior employees; high net household income.

The High Achievers are characterised by a competitive attitude in all areas of life (job, leisure, sport). They want to meet challenges and be among the best. The world view of the High Achievers is shaped by neoliberal convictions; they focus on efficiency orientation, global thinking, cosmopolitan lifestyle, market freedom and deregulation. Their concept of achievement is consistently individualised, their confidence in themselves is high. The members of this milieu have a doer-mentality, and see themselves as smart, dynamic and visionary. The new media are naturally integrated into everyday life. There is a distancing from comfort, contentment on principle, dogmas and ideologies.

Achievement-oriented High Achievers have a rational rather than an emotional relationship to nature. Of all the milieus, they visit inner-city nature attractions the least often. When it comes to the market value of land and buildings, however, the percentage of those who rate nature in the city as a particularly relevant factor is greatest in the lifeworld of the High Achievers. Economic growth is seen as a prerequisite for more nature conservation. In this world view, sustainability is above all compatible where it is associated with new technology, high quality and efficiency: Principles of sustainability and green innovations are welcomed when they bring with them a direct benefit (including profitability, health, enjoyment).

Socio-demographic characteristics:

- Age concentration 30 to 50 years of age; average: 44 years of age.
- Men are slightly over-represented.
- There is a high percentage of couples both with and without marriage certificate; frequently have (younger) children.
- Highest percentage of academic degrees in a milieu comparison.
- Highest percentage of full-time employees in a milieu comparison; many work in qualified and senior positions; high net household income.

The Movers and Shakers milieu is a new milieu that views itself as a postmodern avant-garde. Members of this milieu reject external constraints, traditional roles and routines. They are fleeing the mainstream. Contentment, small-mindedness, bourgeois conventions and ideological corsets are not their thing. Rather, members of this milieu want to break boundaries and experience new things. Many of those in the Movers and Shakers milieu have unconventional careers (for example in the creative industry) and patchwork biographies. In search of movement, innovation and inspiration, they lead a mentally and geographically mobile life, preferably in urban niches.

In the Movers and Shakers milieu, a strong attachment to nature is rather rare. Instead, their attention is focused on their own creative self-development, career advancement and networking with like-minded people. Nevertheless, nature is valued, especially the wild and untamed nature that one often encounters when travelling to distant lands. Although this young, educated and very mobile milieu does not cultivate a sustainable lifestyle, it is certainly sensitised to nature conservation. Many are willing to find out about biodiversity and its conservation and tell friends about it. As long as they are not required to cut back on their own demands, they are not averse to a “greener” lifestyle.

Socio-demographic characteristics:

- Youngest milieu: almost half are under 30 years of age; average: 33 years of age.
- Many are singles without their own children; many still live in their parents' household.
- High level of formal education: An above average number have the Abitur (German university entrance qualification).
- Above average percentage of pupils, students and apprentices; many have never yet been in employment; above-average household income (well-off parents); the personal income is (still) in the lower range.

Milieu of the Middle class

The New Middle Class milieu represents the down-to-earth mainstream of society. Those in this milieu strive for a harmonious life in orderly conditions. The centre of life is family and involvement in the local world with a dense network of friends, neighbours and relatives. Many members of this milieu are bothered by the fear of social decline, as well as the fear of no longer being able to get along technologically, socially and financially, and of not meeting the demands of a globalised economy in the long term. Their self-image is that of being at the centre of society. They see themselves as the "average consumer" and the backbone of the society.

For the New Middle Class, nature is part of life. It is valued above all as a source of raw materials for industry, as a basis for food production and as a family travel destination. For the members of the New Middle Class, the protection of nature is indeed important and there is a basic level of sensitisation, but nature conservation is not the most pressing issue. The New Middle Class sees the responsibility for nature conservation as belonging more to politics than the citizen. Nature conservation issues become interesting above all when benefits such as health, safety and financial savings are added, and when these benefits have become a trend in the mainstream.

Socio-demographic characteristics:

- Middle age group and older people over 40 years of age; average: 56 years of age.
- Low and average level of education; low percentage of university graduates.
- High percentage of married people in the milieu comparison with children; often have older children in the household, but also includes "empty nesters".
- Slightly over-represented in the eastern German federal states.
- Mostly employed; basic/mid-range employees, skilled workers; many are already retired; middle income brackets.

The Adaptive Pragmatist milieu embodies the well-educated, partially over-adapted, purposeful and unideological young middle-class society. Typical of this milieu is a balancing act between achievement and a family orientation, between the need for experience and security, and between autonomy and rootedness. As such, they demonstrate a functional, utilitarian way of thinking, are benefit-oriented rather than risk-oriented, and identify with the meritocracy and competitive society. Extreme is not of interest to those in the Adaptive Pragmatist milieu. Although they want to make life as comfortable as possible and can afford what they like, they remain flexible and realistic.

The young, modern core of the Adaptive Pragmatist milieu has a benefit-oriented approach to nature. Nature primarily means health and recovery for them and they like to relax with their family in nature. Inner-city nature is especially valued. Against the background of their pragmatic attitude and their desire to make life as uncomplicated as possible, they tend to prefer inner-city nature to a (in their view, rather time-consuming) trip to the countryside. The pragmatism typical of this milieu is also reflected in their environmental behaviour. Although they see nature conservation as a duty of society, they see themselves as less responsible, since they see the significance of their own contribution as low.

Socio-demographic characteristics:

- Women are slightly overrepresented.
- Age concentration under 50 years of age; average: 39 years of age.
- Frequently married or living with a partner, often still without children or with small children.

- Intermediate to advanced level of education (Mittlere Reife: high school diploma/O levels; Abitur: university entrance qualification) or still in education.

- Basic, mid-level and skilled employees; above-average number of full-time or part-time employees or still in education; middle to high income brackets (frequently double earners).

Scepticism about growth and globalisation are firmly anchored in the **Socio-Ecological milieu**. Idealism and a sense of mission dominate in the world view of those in the Socio-Ecological milieu. Many see themselves as the conscience of society, the bearers of global responsibility, and ruthless critics of maladministration. Their consumer behaviour is bound to the principle of sustainability. In general, efforts are made to achieve an ecological lifestyle in everyday life on topics such as nutrition, housing, energy and mobility.

In the lifeworld of the Socio-Ecological milieu, nature has a central meaning. The members of this group try to be in nature as often as possible. Seeing, smelling and feeling nature makes them happy and gives meaning to their lives. In particular, they appreciate the untouched, raw, primordial nature. Its diversity is an end in itself and thus worthy of protection. Those in the Socio-Ecological milieu care particularly about the destruction of nature. They do not think just about the benefits to humans. In particular, they also award animals and plants their own right to exist.

Socio-demographic characteristics:

- Wide age range from 30 years of age; average: 55 years of age.

- Mostly married.

- High level of formal education: A third have Abitur (university entrance qualification) or a degree.

- Highest percentage of part-time employees in a comparison of milieus; many qualified employees and senior civil servants, including small-scale self-employed and freelance workers; middle income bracket.

Milieus of the lower middle class / lower class

The Traditional milieu represents the war and post-war generation which loves security and order. The world view of this milieu is characterised by conformity and traditional moral concepts, as well as hierarchical-authoritarian structures. Often, moral decay and alienation are criticised. Action is guided by modesty and adaptation to needs and there are no lofty goals. Rather, those in this milieu keep to routines, and cultivate rituals and customs. Accordingly, there is a great deal of unease about change and little willingness to engage in something new or unfamiliar.

Even the Traditional milieu can be described as connected to nature. Being in your own garden or taking a walk in the (municipal) forest, nature stands for harmony and tranquillity for this milieu, which promises security and stability in the face of a world that is becoming ever more complex. Its knowledge of the endangerment of nature is limited, however. Those in the Traditional milieu perceive environmental problems first and foremost when these are interpreted as an expression of social divergence. For example, the illegal dumping of trash is often considered to be the epitome of environmental pollution, which runs counter to this milieu's traditional ideas of order rather than the ecosystem.

Socio-demographic characteristics:

- The oldest milieu: Concentration in the age segment of 60+; average: 70 years of age.

- Many pensioners and widowed people.

- Mostly low level of formal education (primary school/secondary school).

- Low to moderate income.

The Precarious milieu embodies a socially weaker group of people: The pronounced consumption-materialistic wishes of this milieu ("able to afford something") are counteracted by the struggle to cope with their everyday lives. They must make sure they stay on top of their work demands and their family, keep their job, and not slip (even further) down socially. In this milieu, there is a great yearning for social belonging. Those in this milieu see themselves as disadvantaged by society through no fault of their own, and as victims of global change and political reforms. The experience of deprivation and exclusion often leads to bitterness, but there is very little willingness to protest.

In the lifeworld of the Precarious, nature plays only a subordinate role. From a young age, this milieu has little contact with nature. They hardly think about environmental threats. Far too much of the focus is

on their own problems. In any case, they see the state as being responsible, with nature conservation being given political priority comparatively rarely. Certainly, the members of this milieu know from the media that nature conservation is a socially controversial topic. Protecting nature has no everyday relevance given the challenges to those in this milieu, however. A connection between environmental policy and the improvement of one's own quality of life is hardly perceived.

Socio-demographic characteristics:

- Middle age groups and older people, focus in the age cohort of 50+; average: 57 years of age.
- Above average number of single people and widowed; highest percentage of divorced people in a milieu comparison.
- Significantly over-represented in the eastern German federal states.
- Mostly low level of education (secondary school with or without vocational training).
- More than half are not gainfully employed (pensioners and the unemployed); above-average number of workers or skilled workers; low net household income.

The Escapist milieu is characterised by a strong orientation towards fun and adventure. In the Escapist world view, there is a detached attitude towards the rules and requirements of competitive society. Those in the Escapist milieu are convinced that life has more to offer than just work. They do not think much about the future and want to go where the wind takes them. Their life strategy is self-centred, they want as few restrictive commitments or stress as possible, and want to get the best for themselves without too much effort. Typical for those in the Escapist milieu is their great love of change, life and experimentation, with little frustration tolerance or willingness to do without.

Of all milieus, the Escapist milieu has the least relation to nature. Nature hardly makes an appearance in their lives and is therefore foreign to them. They think first and foremost about fun and entertainment and find "traditional nature experiences" (including hiking, gardening) to be rather uninteresting by comparison. Whether in or outside of the city, nature is primarily seen as a backdrop for sporting activities: Skateboarding, mountain biking or rock climbing; this is where this milieu gets its money's worth. Those in the Escapist milieu live in the here and now. There is little concern about the endangerment of nature. Environmental policy is perceived more as an imposition or "killjoy".

Socio-demographic characteristics:

- primarily younger but also middle age groups: Focus up to 50 years; average: 44 years of age.
- High percentage of single persons (with and without partners in the household); one in two has children.
- All educational qualifications represented.
- Often workers or skilled workers; slightly above-average unemployment rate.
- Above average percentage of pupils, students and trainees; low to average income distribution.

1.3 Explanatory notes on this brochure

The survey results of the 2019 Nature Awareness Study are presented in the following chapters. The new topics ("protected areas", "species knowledge" and "digitisation") are covered in greater detail than those topics already examined and discussed in the previous surveys. Central findings are shown in diagrams and tables. For questions with a multilevel response scale, all answer categories are shown. These are predominantly scales with four-point and five-point levels: The first two categories indicate the degree of approval (for example "agree strongly" / "agree somewhat"), the last two levels indicate the degree of disapproval ("disagree somewhat" / "don't agree at all"). On a five-point scale, the middle category ("partially accurate") shows that the respondent is undecided. If applicable, the category "do not know / no answer" is listed. This answer option was not openly available for selection, however, but was only noted by the interviewers if respondents were unable or unwilling to assess a question or statement.

For reasons of readability and comprehensibility, decimal places have been omitted from the stated percentages and the figures rounded up to whole numbers. If the sum of the figures for all the answer categories was more or less than 100 percent, an adjustment of up to 1.4 percentage points was made for the category "do not know / no answer". In very rare cases, this approach was not sufficient so that in addition, the highest value was slightly adjusted.

The data set was examined for differences in the response behaviour of population groups. The following socio-demographic characteristics of respondents were considered: gender, age (18 to 29 years of age, 30 to 49 years of age, 50 to 65 years of age, 66 years of age and older), formal education (low, medium, high)[9], net household income (up to 999 euros, 1,000 to 1,999 euros, 2,000 to 3,499 euros, starting at 3,500 euros) and BIK size of town (population below 5,000, 5,000 to below 20,000, 20,000 to below 100,000, 100,000 to below 500,000, 500,000 and more)[10]. The Sinus milieu indicator was integrated into the questionnaire in order to allow an evaluation by milieu affiliation, as described in chapter 1.2. Significant differences are explained in the text. In addition, particularly interesting findings were graphically presented in figures or tables.

Established test methods of empirical social research were used in order to check the statistical significance of the survey results. Differences in the response behaviour of population groups were examined by means of the chi-squared test (see Sedlmeier 2013, Eid 2013 or Janssen and Laatz 2010). This is based on a confidence interval of 95 percent (over or under-represented) and 99 percent (significantly over or under-represented), which is customary for social science purposes. Accordingly, traits are interpreted as over-represented (above average) or under-represented (below average) in the sample if the probability is at least 95 percent (significance level of $p < .05$). Features are considered to be 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.[11] It should be noted that the results of significance tests are also dependent on the size of the group being studied. The larger the group examined (for example, people with a high level of education), the more likely it is to prove the significance of weak over- or under-representations (see Janssen and Laatz 2010, page 276). For this reason, in some cases, identical numerical values are shown as being over- or under-represented to varying degrees.

For time series, in other words questions recurring in each study, parametric (t-tests) and non-parametric test procedures (Mann-Whitney test) were used to test the significance of the change over time.

The degree of approval of a question as well as the frequency with which a feature occurs in a population group were colour coded as described above, and explained in the legend. In addition, the numbers were colour coded: In the case of over-represented values and approval (for example, “agree strongly” / “agree somewhat”), the numbers are presented in black; for under-represented values and “disagree somewhat” / “don’t agree at all” numbers are presented in white. Thus, even with a black and white printout, all colour codings are distinguishable from one another. In the case of the milieu diagrams, the areas of overlap between two milieus are marked in the colour of the milieu that has the higher percentage of the response category that is to be represented.

An overview of the response behaviour of the total sample can be found in the appendix to the basic count. There, in table form, all of the subject areas asked are listed in the order in which they were arranged in the questionnaire.

Prior to the main survey of the 2019 Nature Awareness Study, an experimental pre-test was conducted to examine the extent and expected impact of the tendency towards socially desirable responses in the context of the current nature awareness study. The results will be published in a separate report. In-depth analyses of the main survey will be compiled in the final scientific report. This focuses on selected topics and can be downloaded from the beginning of 2021, as can the other publications, at: www.bfn.de/naturbewusstsein.html

2 Protected areas – great importance for people and nature

Establishing and maintaining protected areas are among the core tasks of nature conservation and landscape maintenance. Both nationally and internationally, they are of great importance for the conservation of species, habitats, landscapes and ecosystem services. Protected areas vary in terms of their size, the purpose and objectives of protection and the management rules to be derived from them. The Federal Nature Conservation Act differentiates between the categories of nature reserves, national parks, biosphere reserves, landscape reserves and nature parks, and, due to European requirements, also protected areas according to Fauna-Flora-Habitat Directive, as well as the birds directive of the European Union. The latter two together form the "Natura 2000" European network of protected areas. National parks, biosphere reserves and nature parks are also called large protected areas due to their size.

The protected area categories can overlap and in some cases are even identical. For example, many nature reserves are also FFH areas, and large parts of nature parks are also protected as landscape reserves.

The diversity of the protected areas ultimately also reflects the diversity of the natural and cultural landscapes in Germany, as well as the diversity of the nature conservation goals (including preserving species and habitats, allowing change and dynamism, sustainable exploitation of nature, etc.). They represent valuable spaces to be preserved or developed like an inheritance and are there for specific functions such as the experience of nature, wellbeing, aesthetics, appreciation or recreation. A systematic overview of Germany's most significant landscapes, in this broad sense, shows that protected areas often amount to their spatial core (see Schwarzer et al. 2018).

These legal and nature conservation principles and categories are one thing. The question arises, however, as to what the population thinks about these protected areas. What do Germans understand by protected areas? What do they know about and expect from protected areas? How frequently do they seek them out? And to what extent is there an interest in learning more about protected areas? This chapter provides answers to these and other questions.

2.1 Associations with protected areas

In order to find out what attitudes the population has towards protected areas and what the citizens associate with protected areas, the participants of the study were initially asked what they thought of the topic of protected areas. They were asked to list as many terms as spontaneously came to mind.

Protected area categories were listed most frequently – especially nature reserves, water and bird protection areas.

For 60 percent of respondents, terms relating to the protected area categories most frequently came to mind (see Figure 2). The term "nature reserves" was the most commonly stated (25 percent), with water protection areas (19 percent) and bird sanctuaries (18 percent) also mentioned frequently. National parks (twelve percent), nature parks (eleven percent), landscape reserves (eleven percent) and marine reserves (nine percent) were also mentioned. Areas for the protection of animals (five percent), "reserves" (four percent), areas for the protection of plants (three percent), areas for the protection of forests (two percent) and "world heritage sites" (two percent) were less common among respondents. All other protected area categories such as Natura 2000 as well as non-existent categories were mentioned only rarely (one percent respectively). The Eifel and Bavarian Forest national parks (one percent each) were the most frequently mentioned specific protected area regions (eight percent in total).[12]

With 43 percent of mentions, "landscape/nature" came in second in terms of spontaneous associations with protected areas. This included terms such as habitat/biosphere/biotope (nine percent), woods/forest (eight percent), nature/environment (five percent), fenced off or cordoned off areas (five percent), lakes (four percent), untouched nature (four percent), natural areas (three percent), landscape (three percent), marshes/moors (three percent), water/bodies of water (two percent), river/rivers (two percent), meadows (two percent), wilderness (two percent), jungle/pristine forest/rainforest (two percent), undeveloped areas (two percent), and parks/green spaces/gardens (two

percent). Occasionally, beautiful, clean or healthy landscapes were also mentioned (one percent). The term "original" also came up (one percent).

The protective goals of nature conservation were the third most mentioned terms (41 percent). In addition to environmental/nature conservation (16 percent) and animal welfare (15 percent) in general, the respondents also thought specifically about the protection of plants (eight percent), species (seven percent), bodies of water (six percent), the landscape (five percent), birds (four percent), forests (three percent), seas (three percent), insects (one percent), habitats (one percent, and/or the climate (one percent).

21 percent of mentioned terms refer to "animals/plants/living beings". Here the most common term was "animals" (eleven percent) and/or "plants" (seven percent). Often, however, there was also a specific reference to birds (four percent), insects (two percent), trees (two percent), wild animals such as wolves or deer (one percent), flowers (one percent), fish (one percent), and/or butterflies (one percent). Some respondents referred to "rare/endangered animals" (three percent), "rare/endangered plants" (two percent), and/or to animal diversity (one percent).

Protected areas are often perceived as spaces for experiences and are associated with recreation.

With at least nine percent of responses, the respondents thought of leisure locations (zoo/animal park/forest park) and/or leisure activities (hiking/going for a walk). They also associated protected areas with relaxation (two percent), good/fresh/clean/healthy air (two percent) and "quiet" (two percent).

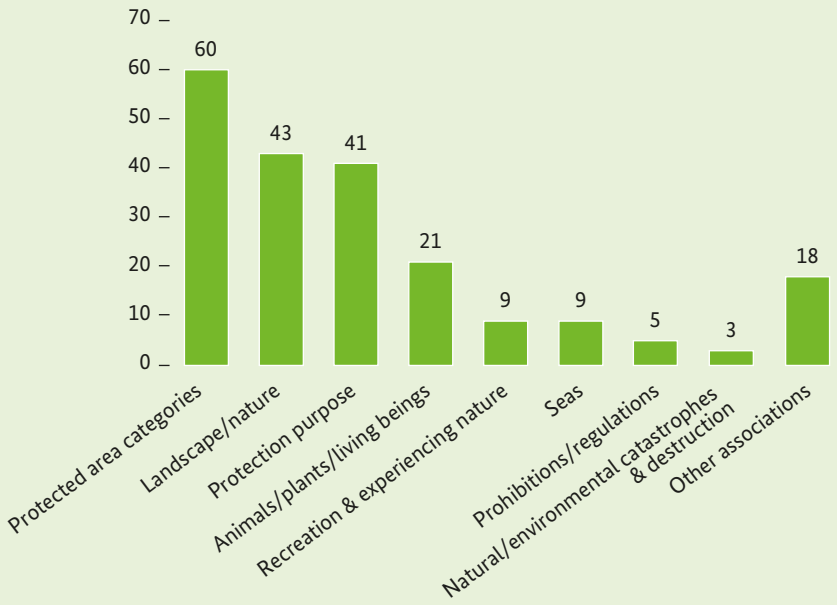
"Seas" made up a total of nine percent of responses. The respondents thought mainly of the Wadden Sea (four percent), the ocean (three percent) and the beach (one percent).

Associations with prohibitions or regulations (for example "rules" or "no entry" signs) are mentioned comparatively seldom with five percent of responses. The same applies to statements about natural and environmental hazards (a total of three percent of responses, "climate change" in particular).

Overall, it is apparent that, in addition to the various area categories, it is particularly the protective function of the areas and the specific protective goals that regularly come to mind, whereas the respondents generally have little awareness of bans and regulations.

Figure 2: 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

2.2 Knowledge of and targeted visiting of protected areas

Many citizens have never heard of Natura 2000 and FFH areas.

77 percent of respondents are not familiar with the term "Natura 2000". 16 percent have heard of it but do not know what the term "Natura 2000" means. This leaves seven percent who not only know the term "Natura 2000", but also know what it means. FFH areas, these are protected areas identified and designated on the basis of the European Fauna-Flora-Habitat Directive, are even less well known. Here, just five percent of respondents say they know what the term "FFH area" means, and a further twelve percent have heard it at least once. However, over four-fifths have never heard the term (see Figure 3).

Figure 3: Knowledge of protected areas

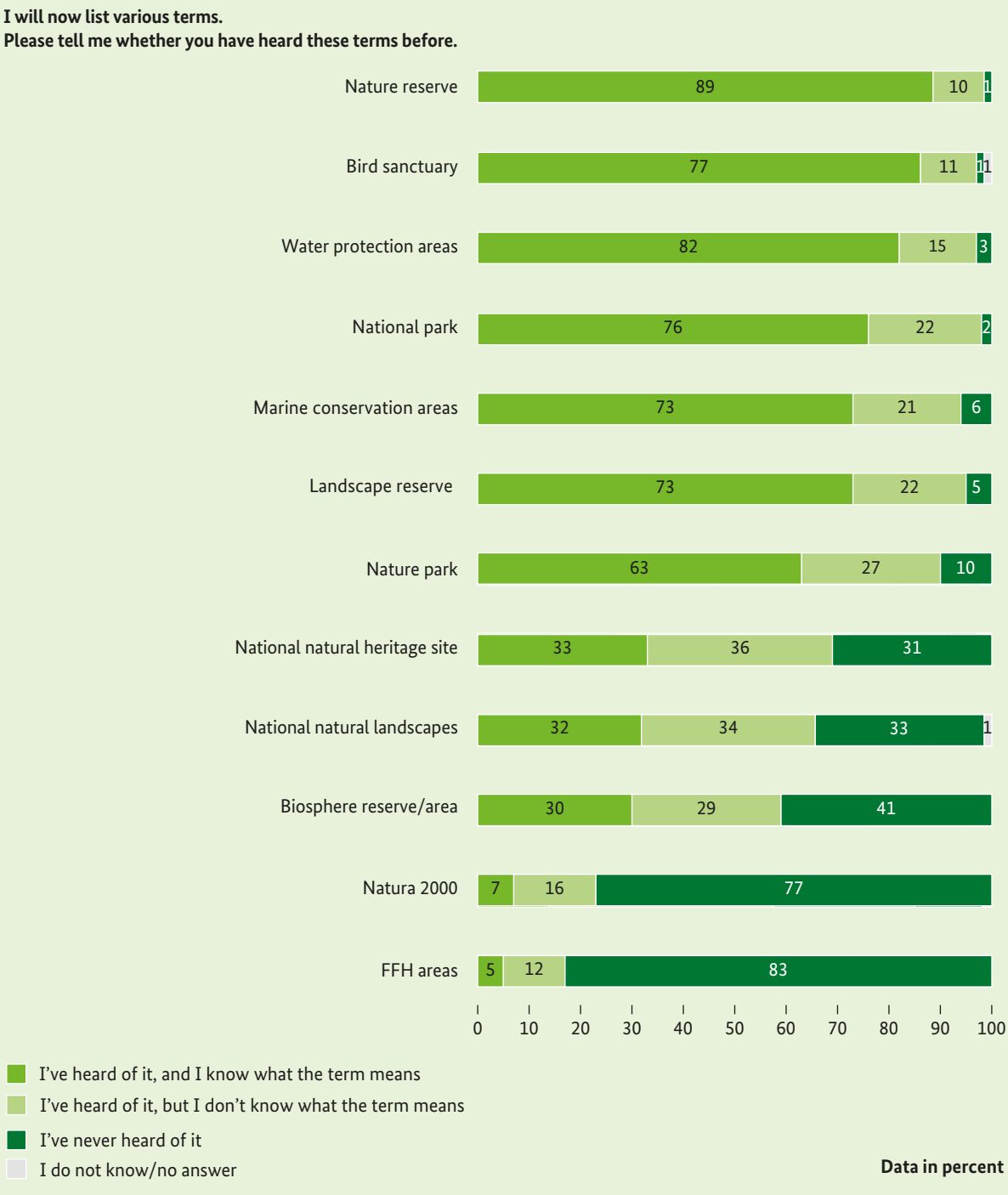


Table 1: Knowledge of protected areas by gender, age, education and income

I will now list various terms. Please tell me whether you have heard these terms before.

Response category: **I've heard of it, and I know what the term means.** Data in percent	Aver-age	Gender		Age (years)				Education			Net household income (€)			
	Ø	M	F	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Nature reserve	89	90	88	86	90	89	89	88	87	93	85	86	90	93
Bird sanctuary	87	88	87	80	90	88	88	87	87	91	83	84	89	91
Water protection areas	82	83	81	78	84	82	83	81	79	87	72	77	85	85
National park	76	77	75	67	77	81	75	72	75	83	75	73	76	79
Marine conservation areas	73	76	71	66	75	75	74	70	73	80	64	68	77	77
Landscape reserve	73	74	72	68	76	74	74	68	72	81	58	69	75	78
Nature park	63	63	63	53	63	69	62	59	62	68	62	60	62	65
National natural heritage site	33	36	29	26	33	35	35	28	32	39	24	33	33	35
National natural landscapes	32	33	31	27	31	35	34	29	32	37	21	32	32	36
Biosphere reserve/area	30	33	27	26	28	36	29	21	31	39	29	26	29	38
Natura 2000	7	9	6	6	7	8	8	5	5	11	6	6	5	11
FFH areas	5	6	4	4	6	5	6	3	4	9	0	5	4	9

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

In contrast, the terms nature reserve, bird sanctuary, water protection area, landscape reserve, marine reserve and national park are much better known. The number of those who state that they not only know the term in question, but also know its meaning ranges from 73 percent (for landscape reserve and marine reserve) to 89 percent (for nature reserve).

90 percent have heard the term "nature park" before, whereas 63 percent also claim to know what it means. The terms "biosphere reserve", "national natural landscapes" and "national natural heritage" have been heard before by 59 percent, 66 percent and 69 percent of respondents, however, no more than a third claimed to know what the terms mean.

If one looks at all the responses on the queried protected areas, it can be said that most people are familiar with the concept of protected areas: Well over 80 percent have heard the terms "nature reserve", "bird sanctuary" or "water protection area" before. As such, the concept of a protected area is well known among the population. However, the more abstract the name of a protected area becomes, the lower the level of awareness.

Knowledge of protected areas varies primarily depending on the respondents' level of education. Across all the terms queried, a higher than average number of the formally well-educated people know what the term means (see Table 1). In addition to education, income and age also play a role: Financially better off respondents have a higher than average understanding of the terms "biosphere reserve", "Natura 2000" and "FFH areas". It is particularly striking that the younger generation of under-30s are often unable to describe what the terms "nature park", "national park", "marine reserve" and "bird sanctuary" entail. Despite these differences, the socio-demographic analysis also shows that the differences are at a generally high level of awareness. In groups with a low level of formal education and low income, many respondents state that they know what the queried terms mean.

The comparison of milieus shows that knowledge about protected areas is strongly linked to the social situation. Those in milieus of a socially elevated position are much more frequently familiar with the different categories of protected areas than those in milieus of a socially modest position. For example, 81 percent of the Established Conservative milieu, 83

percent of the High Achievers and 84 of the Liberal-Intellectual milieu say they know what the term "marine reserve" means. This is in contrast to "only" 66 percent of the Escapist milieu and "only" 62 percent of the Precarious.

Respondents who thought they knew not only the terms "Natura 2000", "national park", "nature reserve", "biosphere reserve" and/or "nature park", but also knew what they mean, were asked to indicate how often they specifically seek out the respective protected areas (see Figure 4).

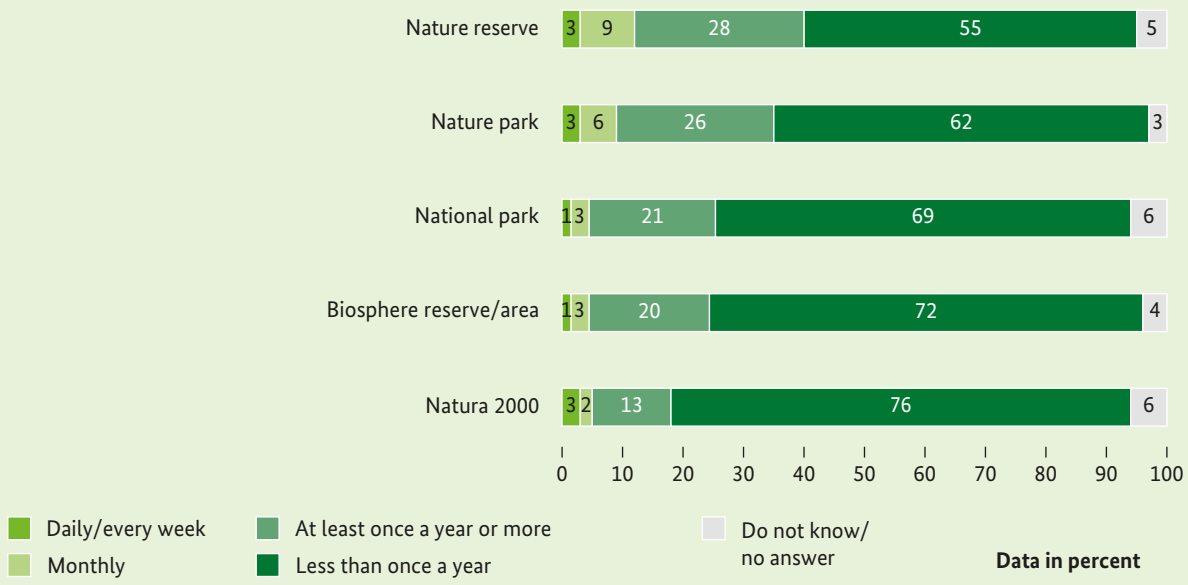
The most commonly sought out are nature reserves: 40 percent of those surveyed go to a nature reserve at least once per year or more, with nine percent going on a monthly basis and three percent even visiting a nature reserve at least once per week. While 35 percent go to a nature park at least once per year or more frequently (monthly: six percent; weekly: three percent), 25 percent and 24 percent respectively visit a national park at least once per year (monthly: three percent; weekly: one percent) and/or a bioreserve (monthly: three percent; weekly: one percent). Natura 2000 areas are the least like to be sought out: Of those aware of the meaning of this term, 18 percent seek out Natura 2000 areas at least once per year or more frequently (monthly: two percent; weekly: three percent).

Targeted visits to four of the five queried protected areas increase with formal education level and occur significantly more frequently than the population average in households with a high net income. Only visits to Natura 2000 areas are independent of the education level and income of the respondents (see Table 2).

When comparing the lifeworlds, the nature reserves are most frequently visited by the Established Conservatives, who view nature as a cultural asset, and the Movers and Shakers, who particularly appreciate wild and untamed nature (at least once per year: 50 percent each). The oldest milieu, the Traditionals, show far less interest (32 percent), as does the socially disadvantaged milieu of the Precarious (26 percent). While the fun and experience-oriented Escapists state above average visits to Natura 2000 areas (at least once per year: 34 percent; average: 18 percent), nature parks are particularly popular among the High Achievers. In this very pragmatic and benefit-oriented lifeworld, 49 percent of those who "know the term" visit a nature park at least once per year. For those in the Traditional

Figure 4: 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.*

Table 2: Targeted visiting of protected areas by education level and income

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

Response category: at least once a year or more Data in percent	Average	Education			Net household income (€)			
	Ø	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Nature reserve	40	31	42	47	28	33	41	49
Nature park	35	24	35	42	29	29	33	44
National park	24	19	23	30	21	21	23	31
Biosphere reserve/area	24	17	25	28	22	17	20	37
Natura 2000	18	20	11	18	26	19	14	17

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

** 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.*

(25 percent), the Precarious (25 percent) and the Movers and Shakers (24 percent) milieus, the figure is fifty percent fewer. National parks are least visited by the Traditional milieu (at least once per year: 15 percent; average: 24 percent).

Protected areas are first and foremost an excursion destination in the region.

In addition to the question of how often individual protected areas are visited, respondents were also asked which locations and on which occasions they visited protected areas (without further specification of the protected area category) – in the immediate vicinity of their residence, as an excursion destination in the region, while on holiday in Germany and/or while on holiday abroad.

52 percent – and thus the majority – of respondents visit protected areas as part of an excursion in the region (see Figure 5). People with high educational qualifications are overrepresented here (57 percent). Protected areas in the immediate vicinity of their residence are the second most visited (46 percent), and visiting when on holiday in Germany (44 percent) the third most common. It is far less likely for respondents to visit protected areas while on holiday abroad

Figure 5: Location of visited protected areas

Where do you visit protected areas?

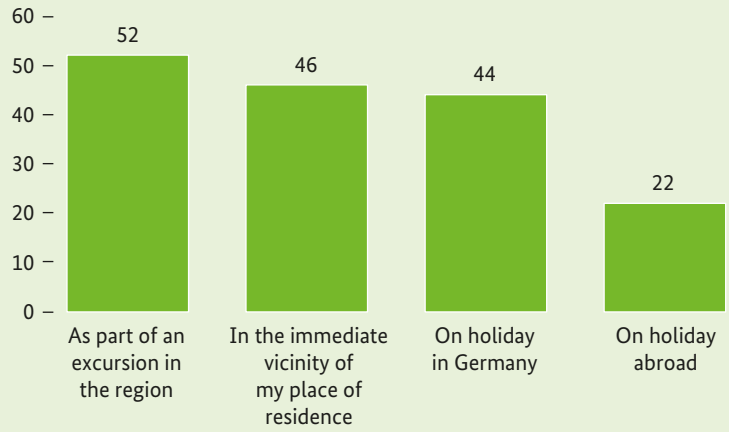


Table 3: Location of protected areas visited by age, education and income

Where do you visit protected areas?

Data in percent	Aver-age	Age (years)				Education			Net household income (€)			
	Ø	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
As part of an excursion in the region	52	49	52	52	53	48	51	57	42	52	53	54
In the immediate vicinity of my place of residence	46	49	46	45	47	47	44	49	46	43	49	49
On holiday in Germany	44	38	46	45	43	36	44	50	25	38	47	48
On holiday abroad	22	21	29	22	14	12	22	33	9	14	23	30

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

(22 percent). It is primarily the formally well-educated and financially well-off who use their holiday to visit protected areas in Germany and abroad (see Table 3).

When comparing age groups, it is also noticeable that: The youngest respondents have visited protected areas while on holiday in Germany less than average (under-30s: 38 percent; average: 44 percent). Whereas the oldest group of respondents visit protected areas abroad less often (over-65s: 14 percent; average: 22 percent).

Furthermore, comparison of town sizes shows that respondents who live in cities with a population of over 500,000 visit protected areas while on holiday in Germany and abroad more than average (49 percent and 27 percent; average: 44 percent and 22 percent).

The milieu analysis reveals: As an excursion destination in the region, protected areas are especially popular in the Socio-Ecological milieu that feels connected to nature (63 percent), and much less so in the Escapist milieu (41 percent), for whom nature is less important. The pragmatic, multifaceted High Achievers most often take the opportunity to visit protected areas in their immediate vicinity (56 percent). Even when on holiday abroad, it is primarily the High Achievers who – a little more than the Liberal-Intellectuals with their wide range of interests (30 percent) – seek out protected areas to visit. This is significantly less common among members of the Precarious milieu (13 percent) and the Traditional milieu (five percent). This is a key finding, as the Precarious milieu often lacks money for trips abroad and the Traditional milieu prefer holidays at home rather than leaving Germany.

2.3 Goals of protected areas and attitudes towards protected areas

In order to investigate what the citizens feel should be the tasks of protected areas, the respondents were presented with a selection of 13 possible protection goals, of which they were asked to pick out what they thought were the three most important.

For the vast majority, preservation of biodiversity is the key task of protected areas.

Named by 68 percent of respondents, preservation of the biodiversity of animal and plant species is by far the most frequently picked of the three most important goals of protected areas (see Figure 6). This shows there is a high level of conformity between the core mission of protected areas – preservation of biodiversity in Germany – and awareness of the tasks of protected areas within the population.

“Allowing undisturbed landscape development” and “preserving beautiful landscapes” were the second and third most frequently named goals (38 percent and 36 percent). This assignment of tasks also corresponds with the legal mandate of nature conservation, which is intended to protect things such as the “variety, particularity and beauty of nature and landscapes”

(Federal Nature Conservation Act, § 1, paragraph 1, point 3). From the perspective of the population, protected areas are primarily about the undisturbed development of the landscape and the preservation of the beauty of the landscape from negative intervention and damage.

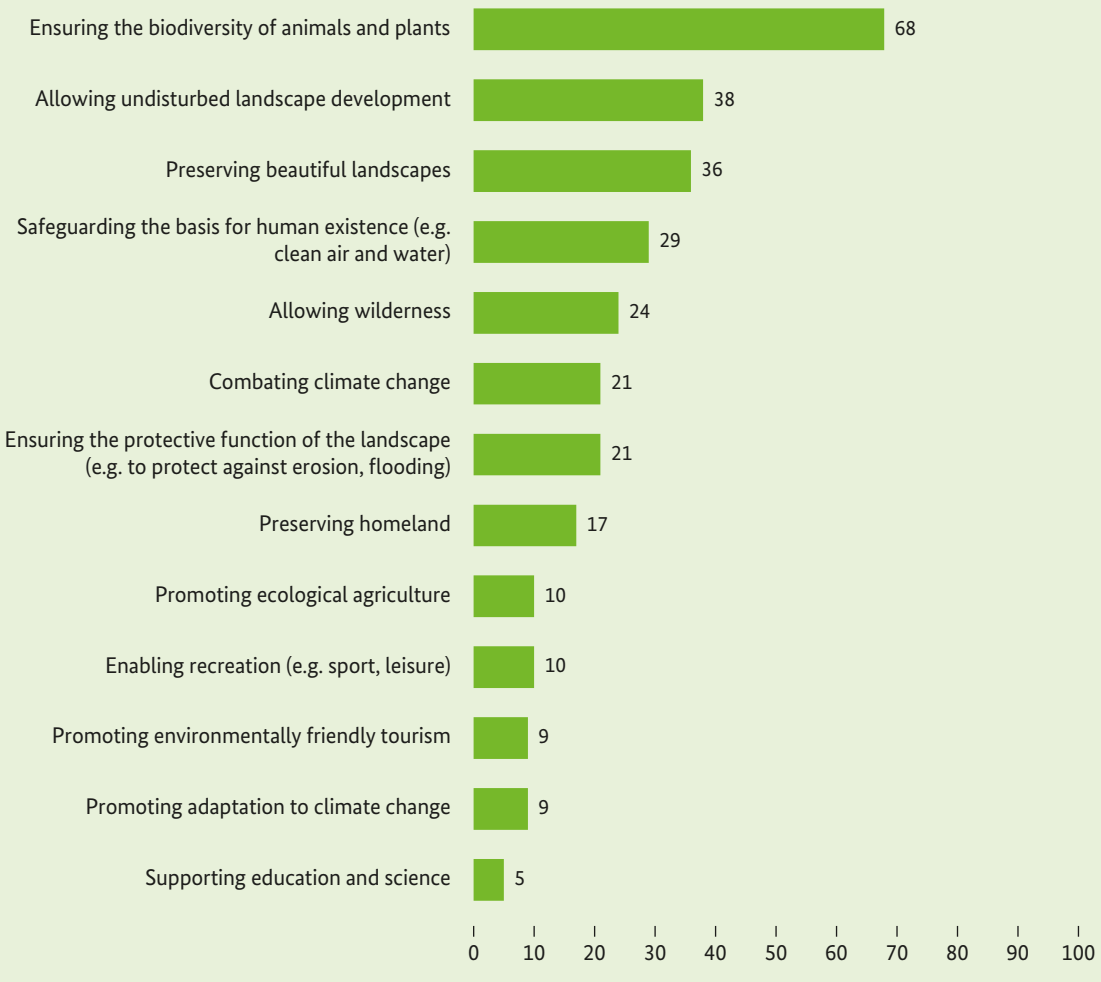
"Safeguarding the basis for human existence" is counted among the most important goals by 29 percent of respondents. "Allowing wilderness" was chosen by 24 percent and is therefore the fifth most frequently chosen goal. The goals of "combating climate change" and "ensuring the protective function of the landscape" followed with 21 percent of responses. "Preserving homeland" was chosen by 17 percent. All other protective functions were emphasised as particularly important by a maximum of ten percent of the respondents. Very few votes were given to the goal of supporting education and science (five percent).

These functional attributions are informative as they also express a kind of "clever anthropocentrism" (Eser et al. 2011 and Ott et al. 2016): Protected areas do not (only) serve "nature", they also contribute to the securing of human livelihoods, protecting against the consequences of climate change and preserving people's homelands. By having protected areas, nature conservation can therefore also claim to make significant contributions to human well-being.

Overall, only a few socio-demographic differences can be identified: The financially well-off (household income over 3,500 euros) often class the aspects of "allowing wilderness" (29 percent compared to 24

Figure 6: Objectives and tasks of protected areas

Please select three keywords from the following which, in your opinion, should be the most important objectives and tasks of protected areas.



percent), "ensuring the protective function of the landscape" (27 percent compared to 21 percent) and "supporting education and science" (eight percent compared to five percent) as the most important goals of protected areas. Conversely, they mention the "preserving homeland" aspect less than average (twelve percent compared to 17 percent). In addition, the age comparison shows that while "preserving homeland" is mentioned far more often by those over 65 than by under-30s (26 percent compared to ten percent), the aspect of "supporting education and science" is highlighted more than average as one of the most important goals by the youngest respondents (nine percent compared to five percent). For nature preservation communication, this could mean that there is an age difference when it comes to the topic of protected areas: Older people are more likely to be reached by the protection of their "homeland" than through the "educational" function of protected areas. Here, the positive emotional connection to homeland can be appealed to. Younger people can be addressed by focusing more on the aspect of protected areas as locations of learning and experimentation. The emotional spectrum is not necessarily less intense, but has a different emphasis: The joy of discovery and finding out new things.

The milieu analysis reveals greater differences than the socio-demographic: The aspects of "ensuring the diversity of animal and plant species" and "allowing undisturbed landscape development" are highlighted above all by the Socio-Ecological milieu (80 percent and 52 percent), which is particularly sensitive to species decline and the destruction of nature, as the central protective functions (average: 68 percent and 38 percent). "Allowing wilderness" is most frequently mentioned by the creative avant-garde, the Movers and Shakers, (33 percent compared to an average of 24 percent), while "combating climate change" is most frequently selected by the modern, young centre of society, the Adaptive Pragmatists (31 percent compared 21 percent on average). "Preserving homeland" is first and foremost among the three most important goals chosen by the milieus in the traditional segment (New Middle Class milieu: 24 percent; Traditional milieu: 25 percent; average: 17 percent). While the Liberal-Intellectual milieu, who pursue an ecologically conscious, health-oriented and sustainable lifestyle, emphasise the promotion of organic agriculture (18 percent compared to ten percent on average), the non-conformist, freedom-loving Escapist milieu emphasise the aspect of "enabling recreation" (15 percent compared to ten percent on average). The Escapist milieu (eight percent) and above all the progress-oriented High Achiever milieu (ten percent) view supporting education and science as an important goal of protected areas (average: five percent).

In addition to the most important goals and tasks of protected areas from the point of view of the respondents, the basic attitudes of the citizens towards protected areas were also examined. To do this, respondents were asked to give their level of agreement with a range of opinions and statements about protected areas.

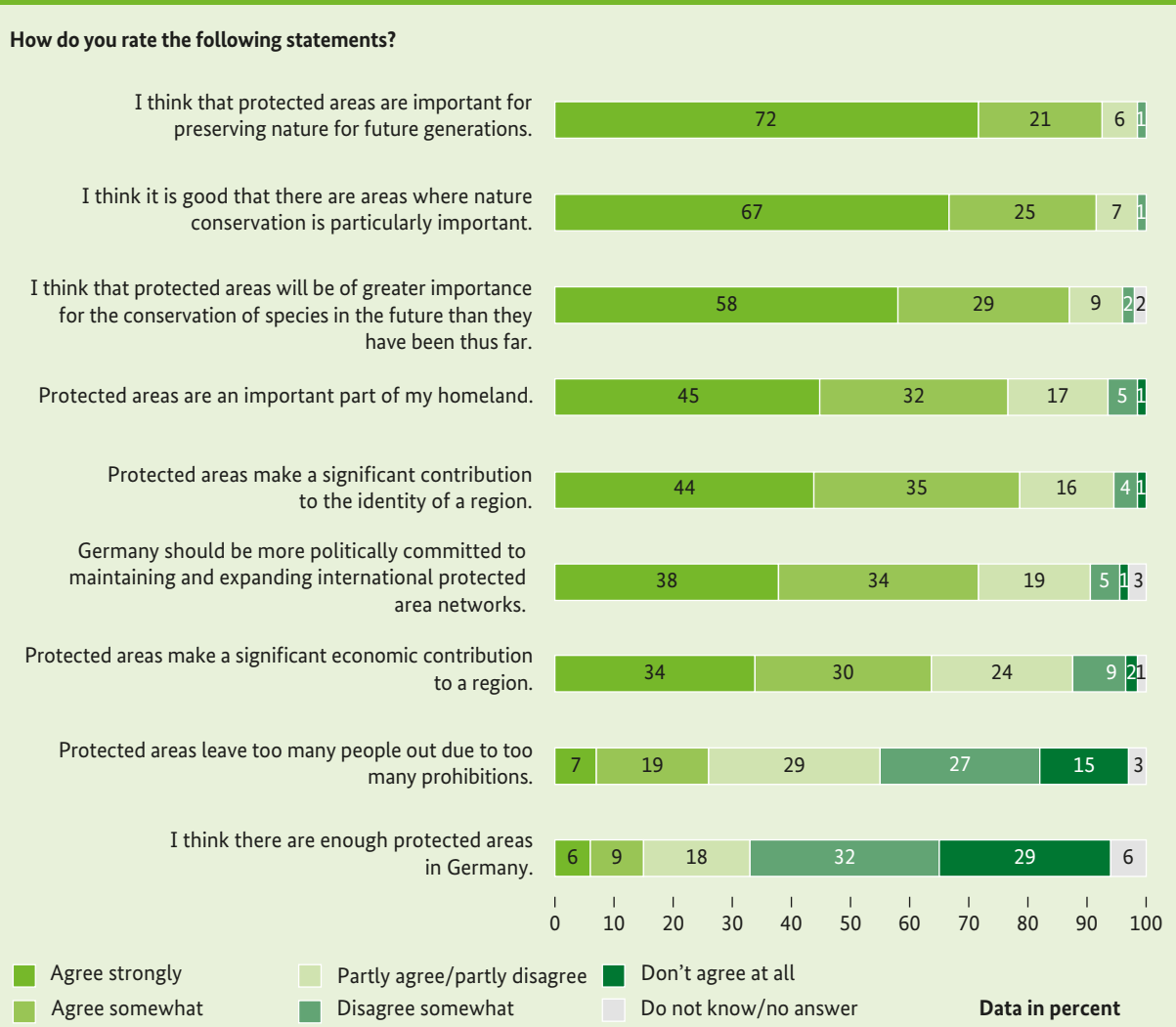
Over 90 percent think it is good that protected areas exist.

93 percent of respondents think protected areas are important to preserve nature for future generations (both approval levels), 92 percent think it is good that there are areas where nature conservation is particularly important, and only 15 percent are of the opinion that there are already enough protected areas in Germany (see Figure 7). These values make it clear that there is a predominantly positive attitude towards protected areas among the population.

In addition, 87 percent of respondents share the belief that the importance of protected areas will increase in the future (both approval levels). 79 percent and 77 percent see a positive connection to "regional identity" and "homeland" respectively. Furthermore, 72 percent are in favour of Germany playing a greater role in expanding international protected area networks, and 64 percent believe protected areas provide a significant contribution to the economic performance of a region. However, 26 percent are of the opinion that protected areas leave too many people out due to too many prohibitions. Seven percent of those surveyed agree "strongly" with this opinion. This corresponds roughly with the number of respondents who thought of bans or regulations when they made spontaneous associations with protected areas (five percent of respondents).

These results are very important with regard to the future of protected areas in Germany. Attitudes towards protected areas are generally very positive. It is all the more striking that two statements relating to the future ("important for future generations" and "will be more important in the future") were rated very highly (92 percent and 87 percent approval respectively). These findings can be interpreted as showing that the population believes protected areas to provide a special contribution to intergenerational justice and the precautionary principle. It is also worth noting that two similar statements - "important part of my homeland" and "makes a significant

Figure 7: Attitudes towards protected areas



contribution to the identity of a region" - were very popular with 77 percent and 79 percent of respondents. This shows that protected areas have a formative character for people's sense of belonging to a region. As homeland, belonging and regional profile are always emotionally positive (see Kühne 2011 and Kühne et al. 2019), nature conservation communication with reference to protected areas can also reach the population on an emotional level.

Again, there are only a few socio-demographic differences in the respondents' response behaviour. The formally well-educated are more likely than average to "agree strongly" with the opinion (1) that there are areas where nature conservation is particularly important (72 percent; average: 67 percent), (2) that protected areas will be of greater importance in the future (64 percent; average: 58 percent), and (3) that Germany should be more politically committed to the preservation and expansion of international protected areas (43 percent; average: 38 percent). The latter opinion is less likely than average in those with a low educational level (34 percent). In addition to these educational differences, the age comparison shows that the youngest respondents (under-30s) were less likely than average to agree without reservation that protected areas are important for preserving nature for future generations (62 percent; average: 72 percent). In comparison, this is 77 percent among 50 to 65-year-olds.

Differentiated by social milieus, the findings clearly show that there is a high level of awareness of the importance of protected areas, especially in the Liberal-Intellectual milieu and in the Socio-Ecological milieu. For example, 87 percent of the Liberal-Intellectuals and 83 percent of the Socio-Ecological respondents "agree strongly" that there are areas where nature conservation is particularly important (average: 67 percent). Once again, it is the Escapist milieu that agrees far less often (49 percent).

2.4 Information interests and preferences for obtaining information

After the respondents had selected what they believed to be the three most important tasks of protected areas, they were then asked (1) which information about protected areas they were particularly interested in and (2) how they wish to be informed about protected areas. To answer these questions they were once again provided with a selection of options from which to pick three choices.

There is the greatest interest in information regarding protected species of animals and plants.

72 percent of respondents rank information about protected species of animals and plants among the three most interesting pieces of information about protected areas. With 46 percent of responses, information regarding protected habitats is ranked as the second of the three most interesting pieces of information. 31 percent are particularly interested in information on the condition of the protected area and 26 percent want to learn more about the type of protection and development measures being implemented (see Figure 8).

For 28 percent of the respondents, one of the most important things is being informed about the experience and recreational opportunities, whereby 19 percent are (also) interested in refreshment options and trails. Information regarding the proximity and accessibility of protected areas near places of residence is one of the three most important pieces of information for over a quarter of respondents. 22 percent wish to be informed about prohibitions and regulations in

Figure 8: Information interests

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.

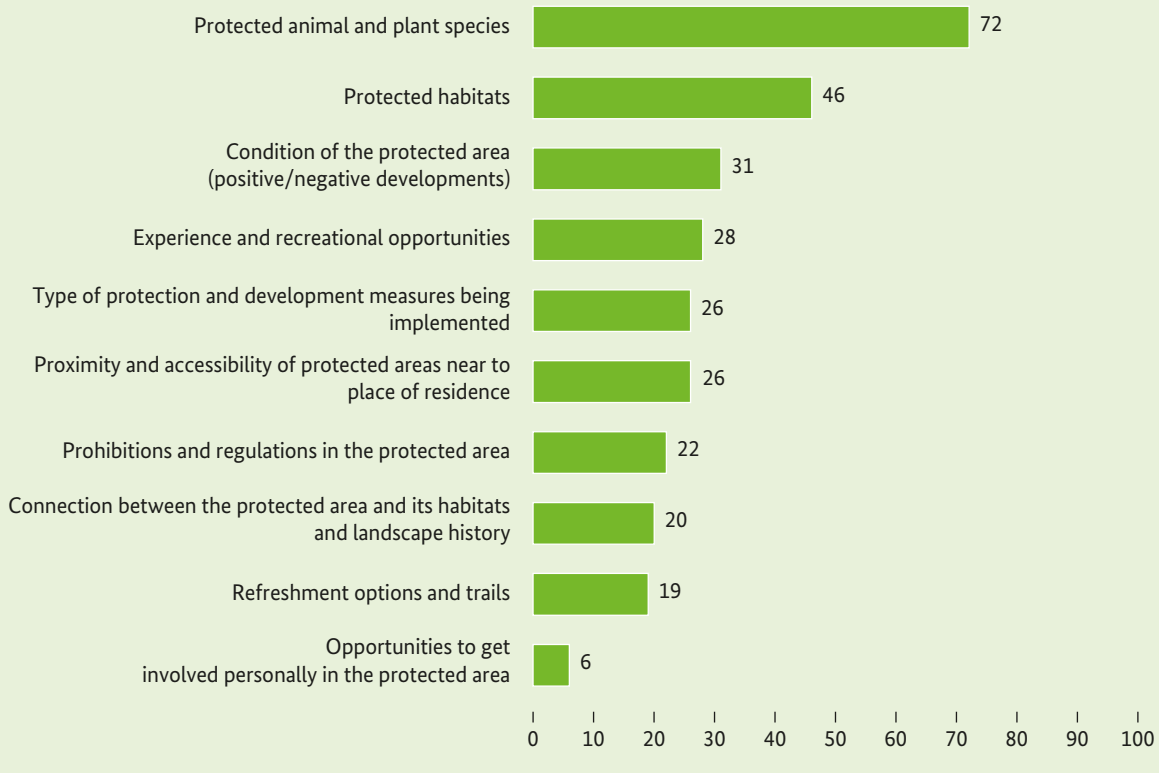
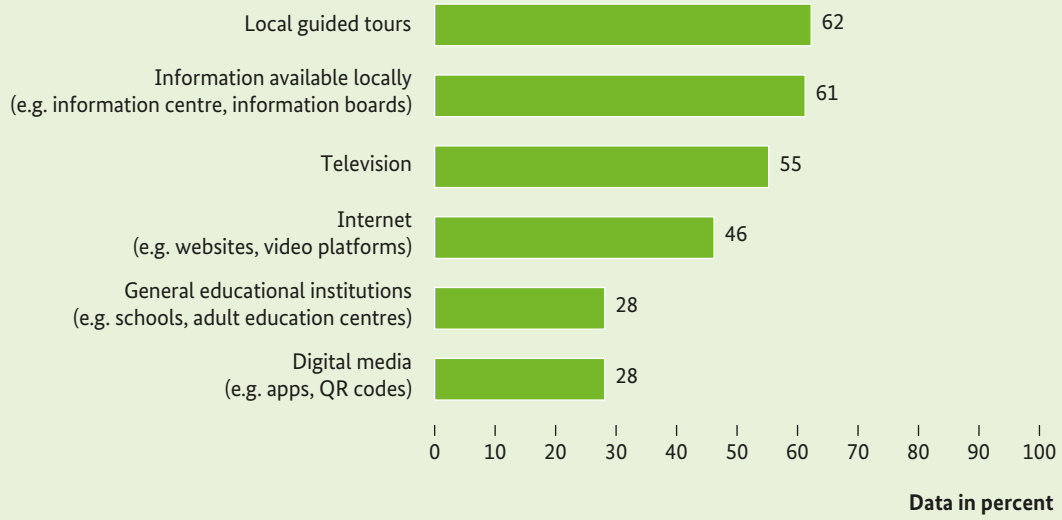


Figure 9: Preferences for obtaining information

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



the protected area. A similar number want information about the connection between the protected area and its habitats and landscape history. Six percent of respondents consider information regarding opportunities to get involved personally in the protected area among the three most interesting pieces of information about protected areas. Although this is the lowest value of all the options provided, it should not be underestimated in view of the various hurdles to personal commitment (for example a lack of time and coordination with others) – not even in quantitative terms: If six percent of the population actually became personally engaged with protected areas, this would have a major impact on the activities on-site.

The socio-demographic analysis reveals few noteworthy findings. It is worth mentioning that the oldest group of respondents, the over-65s, showed an above-average interest in information about the proximity and accessibility of protected areas near their place of residence (32 percent compared to 26 percent on average).

Only a few differences can be seen when comparing milieus: The young, mostly well-educated Adaptive Pragmatist milieu is even more interested in information about protected species of animals and plants than average (79 percent compared to 72 percent on average). The highly functional-minded High Achiever milieu is the most interested in information on the condition of the protected area and the type of protection and development measures being implemented (41 percent and 33 percent; average: 31 percent and 26 percent). It is noticeable that the Liberal-Intellectuals, who like to spend a lot of time in nature, are particularly interested in information about the proximity and accessibility of protected areas near their place of residence (36 percent compared to 26 percent on average). Information about refreshment options and trails is most often desired by those in the Escapist milieu. In this lifeworld, in which there is a high level of affinity with values such as variety, movement and spontaneity, one in four regards refreshment options and hiking trails as the most personally interesting pieces of information (average: 19 percent). When comparing the lifeworlds, information on how to personally get involved in a protected area is most likely to be of interest to the young trendsetters of the Movers and Shakers milieu (ten percent compared to six percent on average).

Information available locally is very popular, but almost half of respondents would also like digital options.

Over 60 percent of respondents included guided tours locally (62 percent) and local information (for example information centres, information boards) (61 percent) among the three preferred ways of obtaining information about protected areas (see Figure 9). The third most popular option as one of the three preferred ways of obtaining information is via the television (55 percent). 46 percent would like to obtain information via the internet, for example through appropriate websites or video platforms. General educational institutions and digital media such as apps or QR codes are counted among the top 3 information channels with 28 percent each, whereby it is remarkable that over a quarter of the respondents named digital media as one of their three preferred information options.

Information available locally is particularly preferred by the elderly, whereas younger people are more interested in internet options and digital media.

A look at the socio-demographic data of the respondents reveals clear differences in response behaviour: While information locally – both in the form of tours and information centres and boards – is more often preferred by older respondents than by younger ones, younger respondents conversely prefer obtaining information online and via digital media much more frequently than older respondents (see Table 4). In addition, television is preferred as an information medium more by people with low educational qualifications and a low income, while online and digital media options are preferred by people with high educational qualifications and a high income.

These findings largely coincide with what we know about the use of media, especially digital media, depending on age and other socio-demographic variables (see BVDW/DCORE 2018 and Seifert/Schelling 2016). If you compare the media use of older people (55 to 69-year-olds) with the media use of younger people (16 to 24-year-olds), it becomes clear that older people prefer television, daily newspapers, magazines and radio far more than younger people. The most important digital media for the elderly (and their most important medium overall) is the PC (desktop, laptop). This medium is used the most often by this age group of all age groups. However, when it comes to smartphones, tablets and smart TVs, the elderly are significantly behind all other age groups, especially the younger ones. The higher the age, the higher the percentage of those who are offline. However, we are dealing with a very dynamic field here: Over the years, digital usage has also increased among the elderly. Two factors are particularly important: encouragement within the social environment (for example from peers), and the perceived usefulness of the medium, which depends, not least, on their personal risk/reward assessment of the internet.

Table 4: Preferences for obtaining information by age, education and income

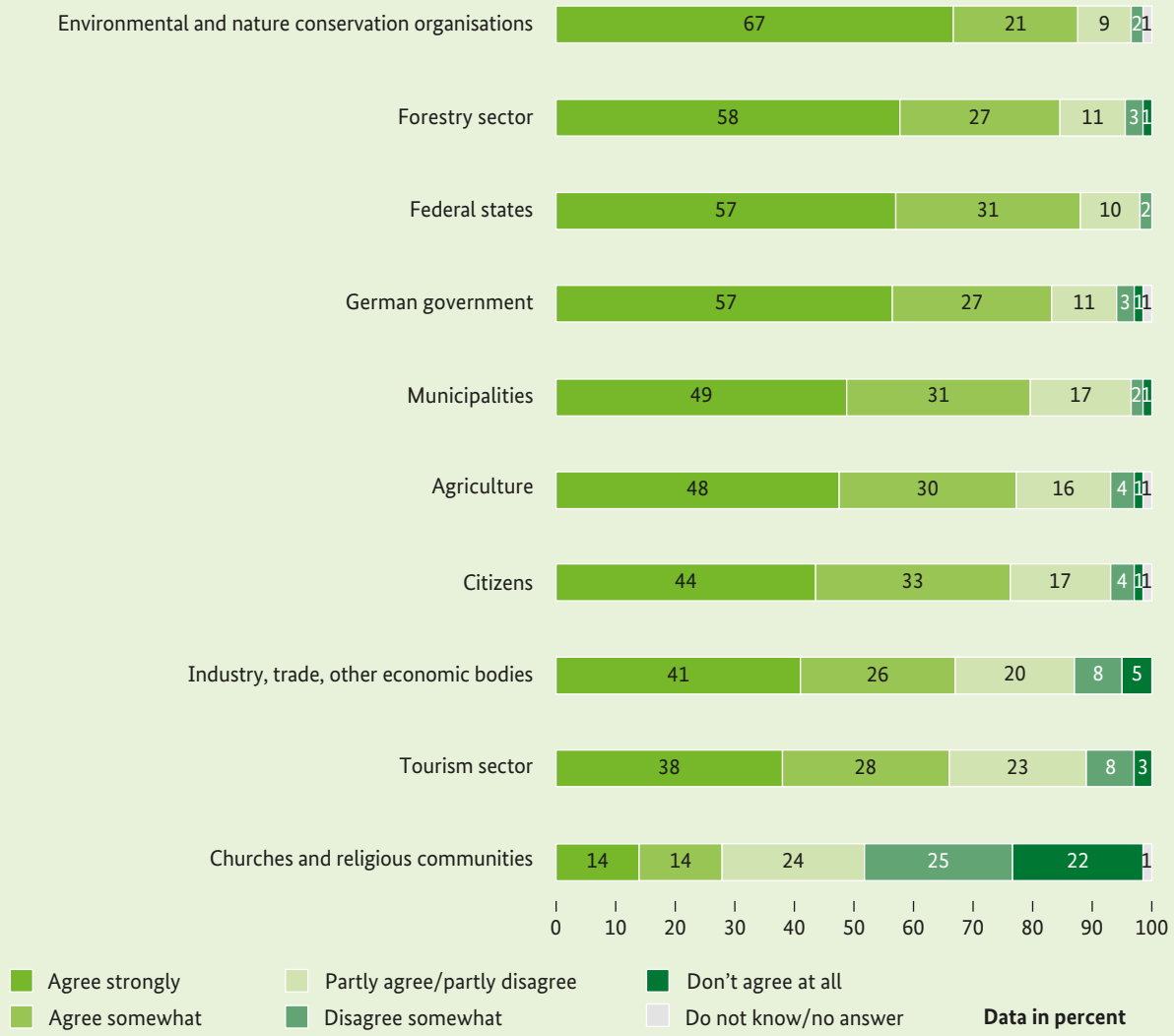
We would like to know how you would like to be informed about protected areas. Please select three preferred options from the following selection.

All mentions	Average	Age (years)				Education			Net household income (€)			
Data in percent	Ø	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Local guided tours	62	50	59	65	70	64	61	61	48	64	62	62
Information available locally (e.g. information centre, information boards, etc.)	61	50	57	62	72	62	60	61	45	65	59	61
Television	55	41	50	58	67	64	57	46	73	63	58	41
Internet (e.g. websites, video platforms, etc.)	46	62	58	45	19	35	48	54	36	35	50	53
General educational institutions (e.g. schools, adult education centres, etc.)	28	28	29	27	31	27	27	31	30	28	28	30
Digital media (e.g. apps, QR codes, etc.)	28	50	34	22	12	19	29	35	19	20	28	38

Heavily over-represented Under-represented Heavily under-represented

Figure 10: Attribution of responsibility

Who, in your opinion, should bear more responsibility for ensuring that protected areas can fulfil their tasks in the future?



Against this background, the different preferences of the age groups for online and offline formats are not surprising (see also Chapter 7: Digitisation). However, it should not be overlooked that 50 percent of the youngest age group surveyed (under-30s) is far more in favour of digital media (apart from the internet) than the older respondents (twelve percent), but this is no higher than, for example, guided tours or information locally (both received 50 percent). Irrespective of the general media preference, there still seems to be a content-specific, in other words influenced by the topic of nature conservation/protected areas, characteristic of the person being addressed to be added. With regard to protected areas, there is much to suggest that digital and non-digital formats can be intelligently combined together, for example, by trying to get people out into nature using digital information.

Preferences for obtaining information are also a question of milieu affiliation. For example, local guided tours are most frequently among the three most preferred information options by the Socio-Ecological milieu (73 percent; average: 62 percent). This is not surprising, as it is the Socio-Ecological milieu who want to (critically) question information and have a great need for interaction and participation. The education-oriented Liberal-Intellectuals (72 percent) and the down-to-earth Traditionals (69 percent) are primarily interested in local information (information centres, boards) (average: 61 percent). In contrast, television finds above-average mention in the bourgeois mainstream (New Middle Class milieu: 66 percent) and in the socially disadvantaged milieus of the Traditionals (69 percent) and Precarious (70 percent) as one of the three preferred sources of information (aver-

age: 55 percent). The young milieus, the Movers and Shakers (64 percent) and the Adaptive Pragmatists (62 percent) are particularly interested in online sources of information, whereby the IT-savvy Escapist milieu (55 percent), High Achiever milieu (56 percent) and Liberal-Intellectuals (55 percent) have a comparatively frequent desire to be informed via websites and video platforms (average: 46 percent). Adaptive Pragmatists (37 percent), High Achievers (38 percent) and Movers and Shakers (47 percent; average: 28 percent) prefer information obtained via digital media such as apps or QR codes.

2.5 Attribution of responsibility

In order to find out to whom the citizens attribute responsibility for protected areas, the participants of the study were asked who, in their opinion, should bear more responsibility for ensuring that protected areas can fulfill their tasks in the future.

Well over 80 claim that the government and states, as well as environmental and nature conservation organisations should assume greater responsibility for protected areas.

88 percent of the respondents are in favour of the federal states taking on more responsibility in the future, with 57 percent of the respondents unreservedly in favour of the states taking on more responsibility (see Figure 10). The federal government received a similarly high level of approval with 84 percent (highest approval level: 57 percent).

A clear majority of the respondents are also in favour of more responsibility being borne by environmental and nature conservation organisations (both approval levels: 88 percent), the forestry sector (85 percent), municipalities (both approval levels: 80 percent), the agricultural sector (78 percent) and citizenry (77 percent). Less responsibility is ascribed to industry, trade and the rest of the economy (67 percent), as well as the tourism sector (66 percent). The respondents see churches and religious communities as bearing the least responsibility (28 percent) – here the rejection of taking on more responsibility (47 percent) is greater than the approval.

Only a few socio-demographic differences could be ascertained: Formally well-educated people "agree strongly" that environmental and nature conservation organisations should bear greater responsibility in the future somewhat more than the average (71 percent; average: 67 percent). Under-30s view the federal states as more responsible than the average (51 percent; average: 57 percent).

The milieu perspective reveals the greatest differences with regard to the ascribed responsibility of the agricultural and forestry sectors: The idea that the forestry sector should pay more attention to issues in protected areas was particularly prevalent among the educated elite of the Liberal-Intellectuals (highest approval level: 74 percent), as well as the older generation of the Traditional milieu (65 percent) who are particularly attached to their homeland. In contrast, approval ratings among the carefree Escapist milieu are significantly lower (39 percent). Agriculture is often ascribed greater responsibility than average by the Liberal-Intellectuals (highest approval level: 61 percent), as well as the highly pragmatic Movers and Shakers (59 percent) and the classic establishment (Established Conservatives: 56 percent). The lowest approval ratings come from the milieus of the benefit-oriented High Achiever (40 percent), the socially disadvantaged Precarious (38 percent), and the Escapist milieu (36 percent).

3 Species knowledge – get to know nature

Biodiversity is a core concept in nature conservation (see Chapter 8). In addition to the diversity of genes and habitats, the diversity of species plays an important role. Knowledge about species and the ability to differentiate between them are important prerequisites for understanding the interdependencies in nature and are key to successful nature conservation. Species conservationists know from their own experience that: "You can only protect what you know". Anyone who is actively engaged in nature and is attentive when taking a walk, can also understand the following: "You only see what you know". So what about species knowledge in our society? Many studies show that relevant knowledge is declining in society (see Wheeler 2014). Even in schools and universities, this topic is rather neglected, with other subsections of biology stealing focus or being added. This may, among other things, be a reason for the lack of new talent and an ageing population among species experts. Observers have long spoken of the "dying out of the experts" (see Frobel and Schlumprecht 2016). According to Bleich in Schulte et al. (2019), there are only 20 people in Germany who have an extensive knowledge of the native beetle species, and about a dozen specialists who can identify mosquitos down to the species level. There are currently no longer any experts in Germany to work on the national Red List of thunderflies (also known as thrips, storm flies or thunderbugs).

Species knowledge is essential for nature conservation: In addition to the high relevance of the professional species experts' ability to record, observe and assess species populations, the cooperation of volunteers is very important in order to be able to meet the need for data and information, for example, for the creation of the Red Lists of Endangered Species for nature conservation monitoring tasks.[13]

But this is not just about the narrower interests of nature conservation. It is about society's awareness of nature. For many people, their relationship with nature is linked to their relationship with certain animal and plant species. In recent years, worrying reports on the decline of native species (for example, the evaluation of the data on the decline of insect biomass collected as part of the so-called "Krefeld Study" published in 2017; see Hallmann et al. 2017) have, thanks to extensive media coverage, caused a remarkable increase in awareness among the population and with many decision-makers. The Bavarian "Save the bees!" referendum received nationwide coverage and was supported by a broad alliance and 1.8 million citizens. They successfully took the bee as their logo, which is popular among the population.

This chapter deals with the range of topics relating to species knowledge and addresses three questions: How do the respondents rate their own species knowledge? How great is the interest in species knowledge? And, from the respondents' perspective, which places would be suitable for improving species knowledge?

3.1 Assessment of own species knowledge

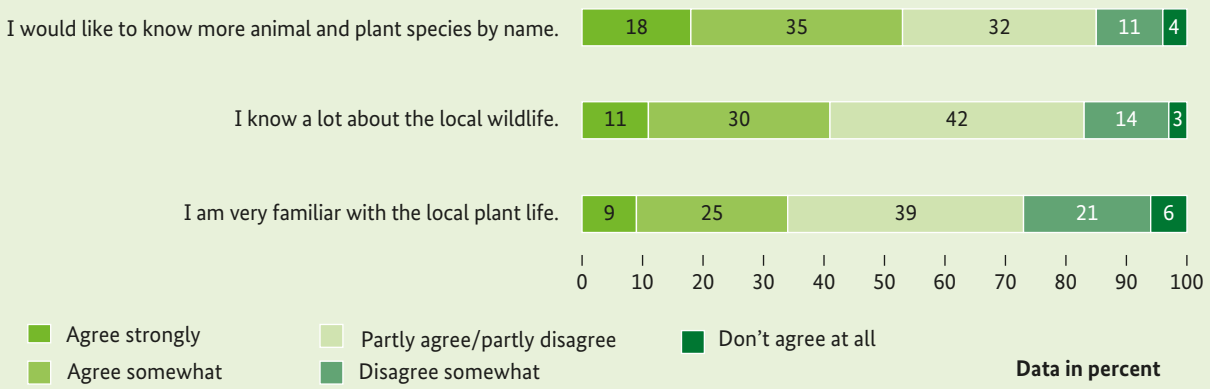
It is understandable that a self-assessment of one's own species knowledge says something different than an external assessment, for example, as part of a test to identify specific species. Nevertheless, a self-assessment was used because people only really "have" these skills and, if necessary, look to improve upon them if they are aware of the skills to begin with.

Around 40 percent declare a (rather) good level of knowledge about the local wildlife.

53 percent of respondents would like to know more about animal and plant species, with 18 percent expressing a great interest in this. 32 percent are not sure about this question and only 15 percent have (rather) little interest. Eleven percent are sure that they know a lot about the native wildlife, 30 percent "somewhat" agree, 14 percent "disagree somewhat", only three percent "not at all". According to the self-assessment, fewer people are familiar with the native plant life: Nine percent are convinced that they know the local plants well, 25 percent "somewhat" agree to the statement, 21 percent "disagree somewhat", six percent "not at all". At 39 percent, the group of those who feel uncertain ("partly agree/partly disagree") is relatively large (see Figure 11).

Figure 11: Assessment of own species knowledge

To what extent do you agree with the following statements?



It is interesting to look at the socio-demographic variables: In the case of both animal and plant species, significantly fewer younger people (up to 29 years of age) claim to have a good level of knowledge, while this is significantly higher among the over-65s (see Table 5). Also, in the group of the financially well-off, an above-average number of respondents claim to have a good level of knowledge about the local wildlife and plant life (both approval levels: 48 percent and 42 percent respectively). There is, however, little to no connection with formal education level.

The town size also has an influence on the self-assessment of species knowledge. Those who live in small towns are significantly more likely to claim a good level of species knowledge. In places with a population of less than 5,000, 56 percent are convinced that they know a good deal about the native wildlife (both approval levels: average: 40 percent) and 51 percent say they are familiar with the local plant life (average: 34 percent).

The milieu analysis reveals that the Socio-Ecological and Liberal-Intellectual milieus, who are particularly interested in information, are the most likely to express a desire to learn more about animal and plant species (both approval levels: 61 percent each). In doing so, they state their current level of knowledge regarding native animals and plants is no better than the average (animal species: Socio-Ecological: 43 percent, Liberal-Intellectuals: 41 percent; plant species: Socio-Ecological: 38 percent, Liberal-Intellectuals: 34 percent; both approval levels). It is noticeable among the progress-oriented High Achiever and Traditional milieus, who feel comparatively strongly connected to their homeland, that they claim an above-aver-

Table 5: Assessment of own species knowledge by age, education and income

To what extent do you agree with the following statements?

Response category: Agree strongly / agree somewhat Data in percent	Average	Age (years)				Education			Net household income (€)			
	Ø	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
I would like to know more animal and plant species by name.	52	50	53	52	53	48	54	56	53	50	55	54
I know a lot about the local wildlife.	40	26	41	40	50	38	39	45	33	40	38	48
I am very familiar with the local plant life.	34	20	33	34	45	33	33	37	25	34	31	42

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

age knowledge of native animal and plant life (both approval levels: animal species: 51 percent and 49 percent respectively; plant species: 45 percent each). In the Precarious and Escapist milieus, both of which are less interested in nature, as well as in the young milieus of the Adaptive Pragmatists and Movers and Shakers, however, respondents are far less convinced of having a good knowledge of local animal and plant species (both approval levels: animals: Escapist milieu: 34 percent, Precarious, Adaptive Pragmatist and Movers and Shakers milieus: 31 percent each; plant species: Escapist milieu: 32 percent, Movers and Shakers milieu: 27 percent, Adaptive Pragmatist: 24 percent, Precarious milieu: 23 percent).

3.2 Interest in species knowledge

Most people are not equally interested in all species groups. There are favourite species and groups of species that are less popular (for example, possibly because they are frightening). There are also a number of species that are not well-known and are difficult to observe or just do not seem interesting enough to many people.

The 2019 Nature Awareness Study investigates which groups of animal or plant species (including fungi) people are particularly interested in, specifically which species groups they would like to know more about. The respondents were able to select three species groups from the list presented.

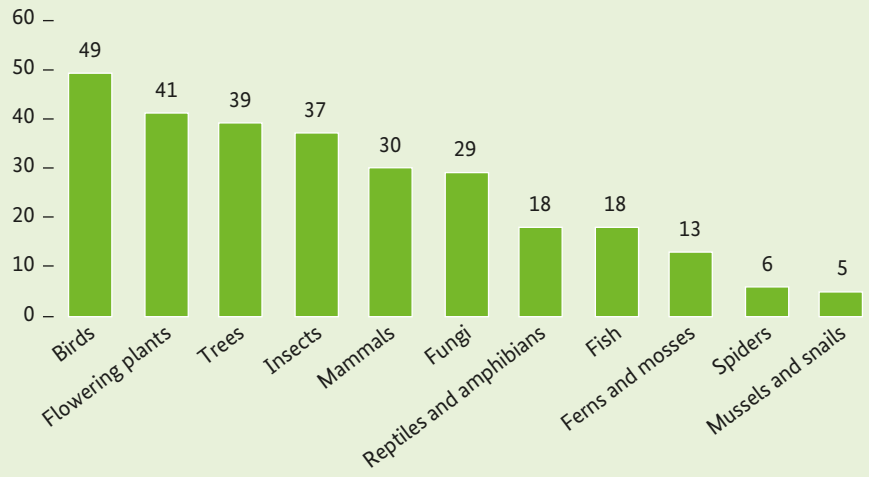
Half would like to know more about birds.

At 49 percent, birds are the most commonly selected of the three groups about which respondents would like to know more (see Figure 12). In second place are flowering plants in general (41 percent), followed by trees (39 percent)[14], insects (37 percent), mammals (30 percent) and fungi (29 percent). There is less interest in reptiles and amphibians (18 percent), fish (18 percent), and ferns and mosses (13 percent). Only a few are interested in spiders (six percent) and mussels and snails (five percent).

The fact that there is even more interest in insects than mammals, although mammals are familiar to us as domestic animals and livestock, could suggest that public debates and media reports about the decline of insect numbers are arousing interest in more information about this species group.

Figure 12: Interest in species knowledge

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



Data in percent

Table 6: Interest in species knowledge by gender, age and level of education

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

Data in percent	Aver-age	Gender		Age (years)				Education		
	Ø	M	F	up to 29	30 to 49	50 to 65	over 65	low	mid	high
Birds	49	48	51	47	48	51	52	52	54	44
Flowering plants	41	29	52	30	37	45	47	43	43	37
Trees	39	36	41	33	40	42	37	37	38	42
Insects	37	40	35	35	38	37	39	35	35	43
Mammals	30	30	29	40	32	26	24	25	33	30
Fungi	29	29	28	22	27	34	28	31	29	27
Reptiles and amphibians	18	24	12	27	23	15	11	15	18	22
Fish	18	24	12	21	18	16	17	17	16	20
Ferns and mosses	13	10	16	8	15	13	14	13	12	14
Spiders	6	9	3	12	6	5	3	6	6	5
Mussels and snails	5	6	5	6	6	4	6	5	4	7

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

When it comes to interest in species knowledge, we mainly see gender differences. While more women than men are interested in flowering plants (52 percent vs 29 percent), as well as in ferns and mosses (16 percent vs ten percent), men show more interest than women in reptiles and amphibians (24 percent vs twelve percent), fish (24 percent vs twelve percent) and spiders (nine percent vs three percent). In addition to gender differences, age differences are also significant. Interest in flowering plants is significantly more pronounced in the over-65s (47 percent) than in the young generation of the under-30s (30 percent). Younger respondents, however, show more interest than the older generation in mammals, reptiles and amphibians, and spiders (see Table 6). This could be due to the fact that reptiles, amphibians and spiders are more popular as pets among younger people than older.

The respondents' educational background plays a comparatively minor role: Formally well-educated respondents have an above-average interest in insects (43 percent), but a below-average interest in birds (44 percent). Interest in certain species is therefore largely independent of whether the respondent has a high or low level of formal education.

In terms of milieus, it is noticeable that the ecologically pioneering Socio-Ecological milieu shows an above-average interest in trees (51 percent), but expresses less interest in reptiles and amphibians (nine percent). The oldest Traditional milieu shows also comparatively little interest in reptiles and amphibians (ten percent). The situation is different among the Movers and Shakers milieu, which sees itself as the postmodern avant-garde and is open to the new, foreign and unconventional: While their interest in flowering plants is below-average (23 percent), of all the milieus they show the greatest interest in reptiles and amphibians (35 percent) and in spiders (14 percent).

3.3 Places for learning about species diversity

In the previous sections, it was discovered that 53 percent of respondents would like to know more about species and which species groups were particularly popular. The question remains, however, as to which locations or institutions the respondents feel would be best placed to communicate this knowledge. Once again, the respondents were presented with a list from which they could pick three learning locations.

The most important locations for learning about species are listed as being out in nature and in school.

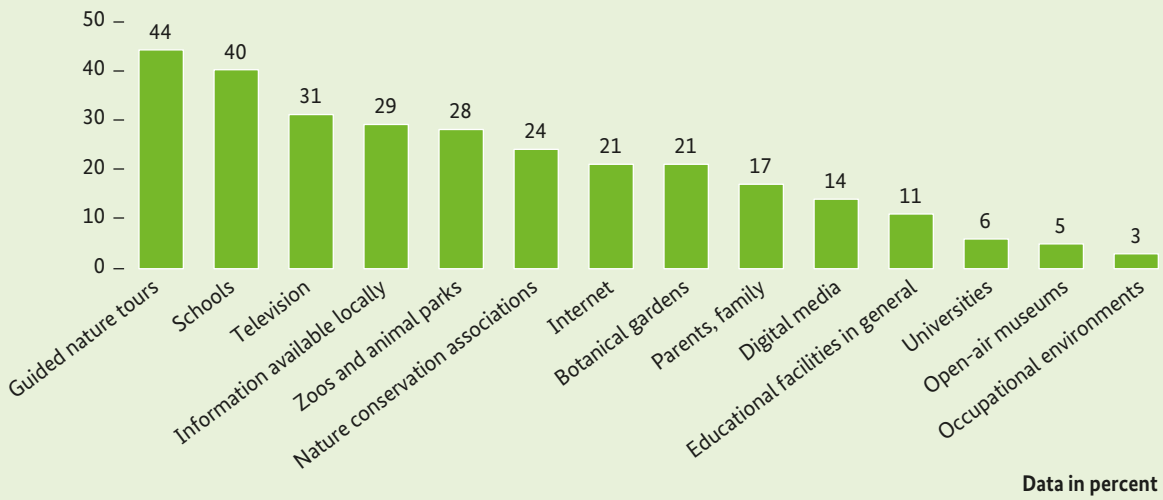
44 percent of respondents consider guided nature tours to be one of the top three most important locations for learning about different species (see Figure 13). Schools are in second place, with 40 percent of mentions. This is followed by television, local information (for example information centres, information boards), as well as zoos and animal parks, each with around 30 percent of mentions. Nature conservation associations were named by 24 percent, the internet (for example websites, video platforms) and botanical gardens by 21 percent each. Parents and the family environment were seen somewhat less frequently as being particularly suitable for learning about species diversity (17 percent). Digital media (for example apps, QR codes) (14 percent) and general educational facilities such as adult education centres (eleven percent) were also chosen less often. The least mentioned are universities (six percent), open-air museums (five percent) and the professional environment (three percent).

Once again, response behaviour primarily varies depending on respondent age: It is particularly noticeable that the under-30s are far more likely to want information via the internet and digital media than the over-65s, whereas the oldest group of respondents are significantly more likely than the younger respondents to prioritise guided nature tours, information via the television and information from nature conservation associations (see Table 7). With regard to the education and income of the respondents, the following can be observed: Online information and digital media are preferred by people with a high level of education and a high income more often than by people with a low level of formal education and a low income. In contrast, people with a low income and low level of formal education more frequently get information via the television and the educational mandate of schools.

When interpreting the findings, it must be noted that the content communicated is not independent of the media used: A 45-minute television programme can communicate more information on a variety of topics than a display board at the zoo. Overall, it is noticeable that the "classic" knowledge transfer formats – guided nature tours, schools, television programmes – play an important role, even in the age of digitisation. The strong preference for guided nature tours, which, apart from school education, is chosen by a significant margin over all other options, should be particularly emphasised. However, preference for a certain educational offer alone does not say anything about the quality or sustainability of the knowledge transfer, and pedagogical and topic-specific expertise must be taken into account when carefully planning corresponding options.

Figure 13: Places for learning about species diversity

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



Data in percent

Table 7: Places for learning about species diversity by age, education and income

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

All mentions	Aver-age	Age (years)				Education			Net household income (€)			
Data in percent	Ø	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Guided nature tours	44	35	42	47	48	41	46	45	38	43	43	47
Schools	40	42	41	38	41	45	41	34	49	43	41	37
Television	31	21	31	33	37	34	35	26	45	35	32	24
Information available locally	29	26	31	30	28	30	28	31	21	28	29	31
Zoos and animal parks	28	28	28	25	31	29	28	28	23	30	31	25
Nature conservation associations	24	20	20	26	28	25	23	23	24	20	24	26
Internet	21	34	27	19	8	17	21	25	14	17	20	27
Botanical gardens	21	21	18	22	22	21	22	19	16	22	21	20
Parents, family	17	12	16	18	20	17	16	17	29	19	18	13
Digital media	14	28	17	11	5	10	15	19	7	12	14	18
General educational institutions	11	9	10	10	14	11	8	13	13	10	10	12
Universities	6	9	6	6	4	5	5	8	4	5	6	7
Open-air museums	5	5	5	4	8	6	5	5	5	8	5	4
Occupational environment	3	2	4	3	1	2	3	4	2	2	2	5

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

The milieu findings make it clear that preference for the learning options displayed is influenced by the respondents' general media preferences. Internet sites and digital media are primarily prioritised by the digital-savvy milieus of the High Achievers (internet: 34 percent, digital media: 16 percent), the Liberal-Intellectuals (31 percent and 18 percent respectively), the Movers and Shakers (both 29 percent) and the Adaptive Pragmatists (28 percent and 21 percent respectively). Schools and the family environment are most frequently selected as suitable learning options in the communication-loving Socio-Ecological milieu and in the educationally disadvantaged Precarious milieu (schools: Socio-Ecological: 52 percent, Precarious: 49 percent; family environment: each 25 percent). While guided tours in nature are most often preferred by the mainstream (New Middle Class milieu: 54 percent), information from nature conservation associations is of particular interest to the older generation of the Traditionals who like safety and order (31 percent). Information obtained via the television is most often preferred by the New Middle Class milieu and the Precarious milieu (39 percent each).

4 The connection between humans and nature – a contradictory relationship

The term 'nature' is central to a nature awareness study. At the same time, there are few terms that are more difficult to grasp. This is mainly due to the ambiguity of the term and its functions (see Erdmann and Mues 2017). Nature is considered to be powerful and strong, but also fragile and endangered. On the one hand, humans are a part of nature, while on the other hand, they have moved away from it into an increasingly artificial world over the course of time. This alienation from nature is increasingly perceived as a problem. There is no longer any nature in the world that is completely untouched and it is always shaped by human perceptions and influences. We love nature, yet we are always afraid of it. We protect nature, but we also destroy it. Even the natural sciences cannot give us a comprehensive idea of what nature is, as their classic reductionist methods can only ever grasp partial aspects of nature as a whole. It can also be difficult if not impossible for us laypeople to develop a coherent overall picture of nature from the widely ramified and constantly changing state of research in the various individual and sub-disciplines. Our diverse and contradictory ideas of nature are as diverse and even contradictory as human relationships with nature. Those looking for conceptual order can stick to natural philosophy (see, for example, Kirchhoff and Karafyllis 2017). Those who want to understand the social meanings and references of the term 'nature' can turn to the social sciences (see, for example, Rückert-John 2017).

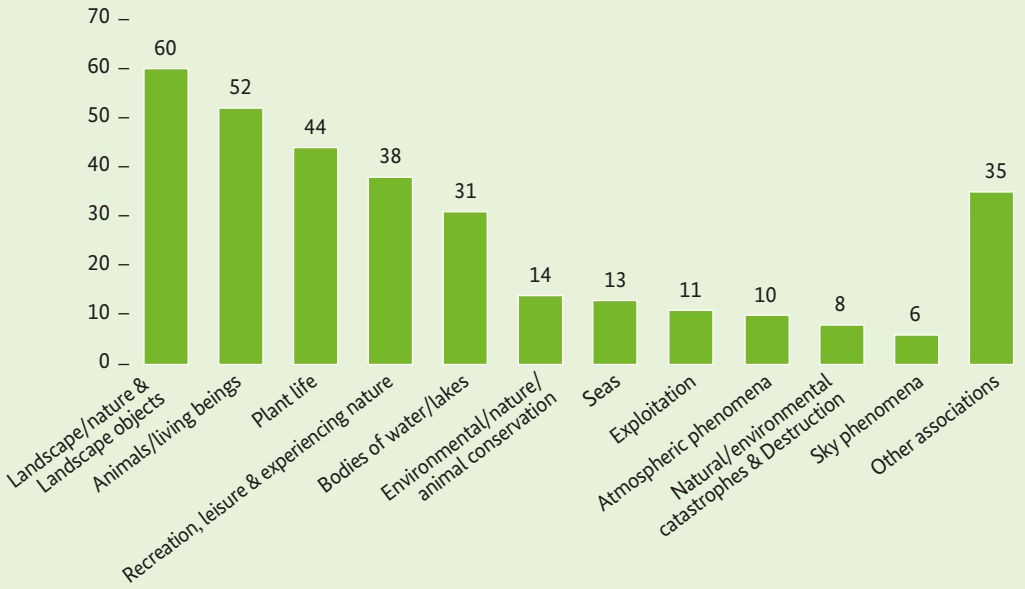
In the 2017 Nature Awareness Study, questions were asked, in a final step, about general attitudes towards nature, as well as the personal significance of nature.[15] The current study will follow on from this to create a time series and to be able to spot any developments. In 2019, too, we will ask about the personal significance of nature (Chapter 4.2), as well as the assessment of natural hazards and nature conservation (Chapter 4.3). As in 2017, we want to know the opinion of the population regarding nature conservation, caught between politics and economics (Chapter 4.4).

4.1 What is nature?

In order to investigate what Germans understand by the term 'nature', the respondents were asked to freely and spontaneously express what comes to mind when they think about nature and what nature means to them. Associations with the term 'nature' were already queried in the 2009 Nature Awareness Study, but at the time respondents were asked first for nouns and then for adjectives. Then respondents were asked

Figure 14: Associations with nature, mentions sorted by category

I would like to know 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. (Open question)



Data in percent

which images come to mind when they think about nature. The freer method used in this current study follows the methodology used in the 2013 Nature Awareness Study (there on the subject of wilderness), 2015 (urban nature and agricultural landscapes) and 2017 (marine nature).

When it comes to nature, people most often think of the landscape as well as natural features and landscape objects.

In terms of the answers to the open question, the category of "landscape/nature and landscape objects" comes first with 60 percent of mentions (see Figure 14). It is noticeable that the neutral term "landscape" is less often mentioned directly (five percent) than its individual components, above all forests (26 percent), meadows (16 percent), mountains/Alps (ten percent) or – provided with characteristics – a beautiful, clean or healthy landscape (five percent) and untouched nature (five percent). Parks/green spaces/gardens, "everything that surrounds us", undeveloped areas and/or the biosphere account for three percent each. Two percent of respondents think about wilderness and/or rocks/minerals. All other landscape objects are mentioned less often (including marshes, sand, deserts, cliffs, glaciers, nature parks, heaths and valleys with just one percent each).

In second place with 52 percent of mentions, people associate "animals/living beings" with nature. The term "animals" is most frequently mentioned (35 percent), but groups of animals are also mentioned, such as birds (twelve percent), insects (six percent), wild animals (four percent), fish (four percent), bees (two percent), butterflies (one percent), deer (one percent), wolves (one percent), rabbits (one percent), farm animals (one percent) and marine animals (one percent).[16] For human beings, nature explicitly comprises living nature and, in the narrower sense, the lives of animals.

Wildlife is more often thought of than the world of plants.

The "world of plants" comes in third place with 44 percent of mentions and is therefore behind the "animal world": 27 percent mention plants in general, 17 percent think of trees, nine percent of flowers, three percent of fungi, two percent each for shrubs/hedges/bushes, grasses/lawns and/or the diversity of plants. Herbs/medicinal/wild herbs, foliage/leaves/autumn leaves and mosses are comparatively rarely mentioned (one percent each).

The "recreation, leisure and experiencing nature" category accounts for 38 percent of responses. Here people primarily think of good/fresh/clean/healthy air (19 percent) and the ability to relax (13 percent). Six percent think about hiking or walking. Nature is also associated with peace (eight percent), freedom (three percent), health (two percent) and/or wellbeing (two percent). Three percent associate nature with excursions, one percent with holiday.

The "bodies of water/lakes" category is ranked 5th (31 percent). In addition to lakes (twelve percent) and bodies of water (eleven percent), rivers (nine percent), clean/clear water (four percent), streams (three percent) and/or ponds (one percent) are also mentioned.

Spontaneous comments also relate to environmental, nature and animal conservation.

With 14 percent of responses, those surveyed think about environmental, nature and animal conservation when contemplating the topic of nature. Even without it explicitly being pointed out, many people clearly associate nature with a need for protection. Four percent spontaneously stated that nature "must be protected", three percent that nature is the "basis for human existence", and one percent that nature is "important for future generations". Two percent explicitly named environmental/nature and/or animal conservation, while one percent mentioned species protection, water protection, the protection of plants and/or protected areas. Occasionally, respondents spoke out against chemicals, fertilisers and pesticides (one percent each).

Both the mention of environmental, nature and animal conservation and the explicit naming of nature and environmental destruction indicate that many people perceive nature as endangered. A total of eight percent of responses fall into this category. Things such as climate change (two percent) and global warming (one percent) were mentioned, and plastic waste, deforestation, species extinction and forest dieback are associations people make with nature (one percent each). Some respondents spontaneously cite people's "greed" as the reason for the destruction of nature (one percent).

Under the "seas" category with a total of 13 percent and in addition to seas/oceans (eleven percent), respondents also mention beaches/tides/low tide/high tide, dunes and/or tidal flats (one percent each).

Eleven percent are mentions regarding the "uses of nature": fields (five percent), agriculture (two percent), agricultural products such as fruits and vegetables (two percent), and arable land (one percent).

Another subject area can be summarised under "atmospheric phenomena" category (ten percent). This includes "weather" (two percent) and "climate" (two percent). In addition, there are references to the seasons (two percent) and weather phenomena such as precipitation (three percent), gales (two percent) and storms (one percent).

With a total of six percent, "sky phenomena" form another category. The sun/sunrise/sunset (five percent) are the most commonly mentioned in this category. Some respondents also thought of the sky (one percent) and/or the moon/stars (one percent).[17]

The "other associations" category (35 percent) includes some statements that could not be further amalgamated. However, some individual terms, particularly the term "life" (five percent) stand out. The term "human" (three percent) also comes up, which emphasises that humans are part of nature. The dominant colour of nature appears to be "green" (four percent of mentions).

It should be noted: In the mirror of social nature awareness, nature is shown to be a diverse and differentiated construct, which sometimes has very heterogeneous components of meanings (untouched – used; intact – endangered), which can also be found in the conceptual history. A "triumvirate" of landscape, plants and animals make up the core of the term. Human exploitation of nature is divided up into "positive" components (recreation, experiencing nature) and negative components (endangerment/ destruction).

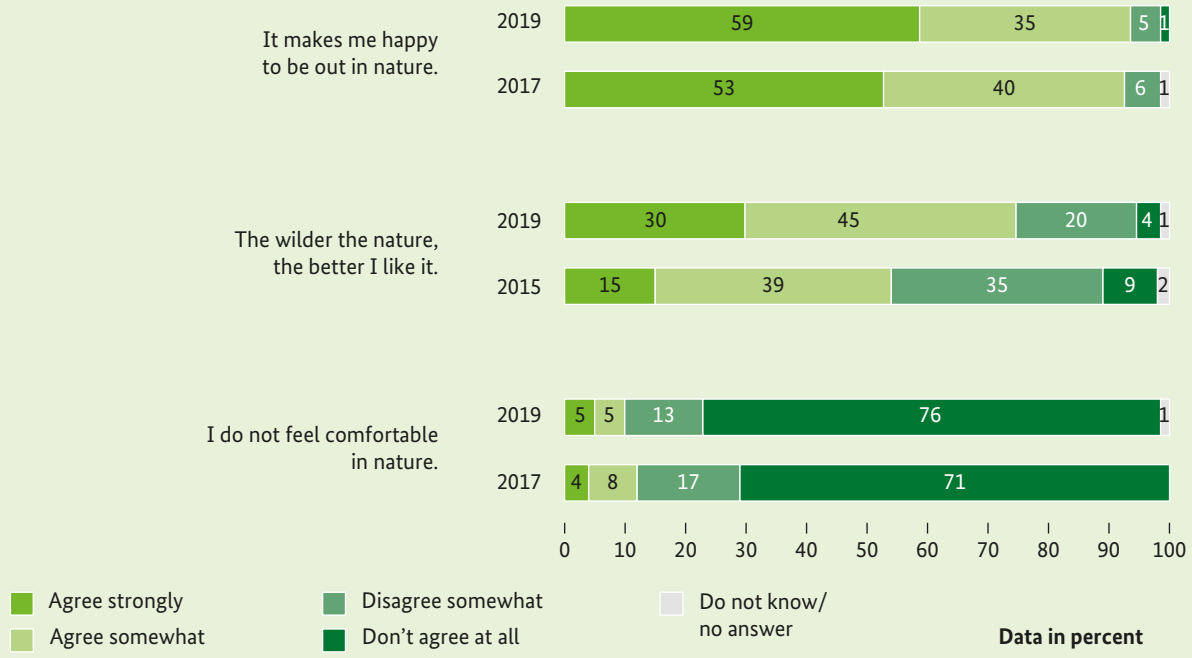
4.2 Personal understanding of nature

The preference for "wild" nature has increased.

In comparison with the results from 2017, the current findings confirm that nature plays an important role for Germans (see Figure 15): 93 percent of those surveyed in 2017 said it made them happy to be in nature, whereas this has increased to 94 percent in the current survey (both approval levels). Furthermore, in 2017, twelve percent said they did not feel comfortable in nature; in the current survey this decreased to ten percent. It is noteworthy that the preference for "wild" nature has significantly increased since 2015 (this question was not asked in 2017): In 2015, 54 percent

Figure 15: Personal understanding of nature in a comparison over time

For each of the following statements, please tell me whether you agree with it strongly, somewhat, not really or not at all.



Comment: The "the wilder nature is" item was added for 2015 (not surveyed in 2017).

Table 8: Personal understanding of nature by gender, age and level of education

Please tell me for each of these statements whether you agree with it strongly, somewhat, partly, not really or not at all.

Response category: Agree strongly/agree somewhat Data in percent	Aver-age	Gender		Age (years)				Education		
	Ø	M	F	up to 29	30 to 49	50 to 65	over 65	low	mid	high
It makes me happy to be out in nature.	93	91	96	86	93	97	96	93	95	94
The wilder the nature, the better I like it.	75	76	74	76	75	78	71	70	75	80
I do not feel comfortable in nature.	11	11	11	13	10	10	10	11	10	9

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

said they like nature more the wilder it appears; this increased to 75 percent in the current survey. In contrast to the 2017 and 2019 surveys, the 2015 Nature Awareness Study was carried out in the summer rather than in the winter. It cannot be ruled out that the expressed preference for "wild" nature in winter 2019 is at least partly due to the change in the time the survey was carried out.

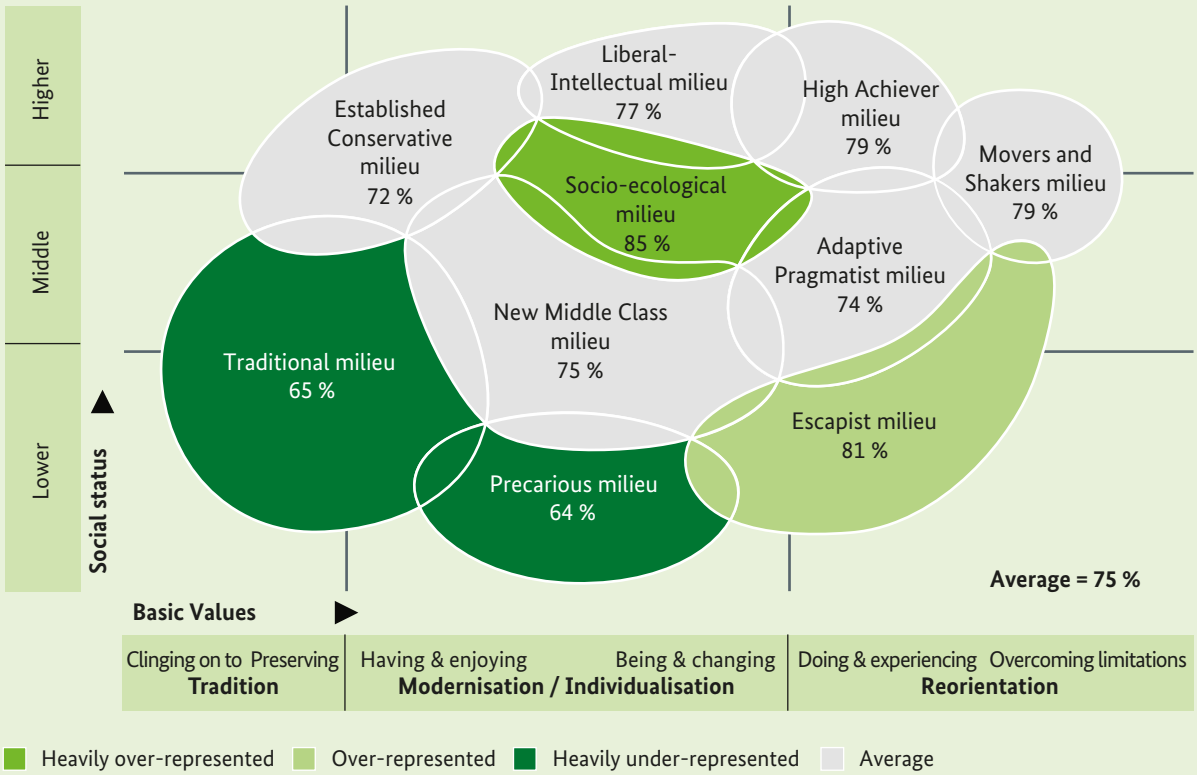
Women are more likely than men to say that being out in nature makes them happy, as are people over 30 compared to those under 30 (see Table 8). In addition, the findings show that a preference for "wild" nature increases with level of education.

The preference for "wild" nature is most widespread in the Socio-Ecological and Escapist milieus.

When looking at the milieus, it is noticeable that the personal appreciation for nature is by far the lowest in the Escapist milieu. One-in-four in this milieu state they do not feel comfortable in nature (both approval

Figure 16: Preference for "wild" nature by Sinus milieu

"The wilder the nature, the better I like it."
Response category: "agree strongly/agree somewhat"



levels: Escapist milieu: 24 percent, average: eleven percent). In this context, it can be assumed that Escapists primarily mean nature cultivated by humans (for example, gardens) compared to untouched "wild" nature. Because: 81 percent of the Escapist milieu (also) state that they like nature more the wilder it is (both approval levels: average: 75 percent). Only in the Socio-Ecological milieu is the preference for "wild" nature more widespread (85 percent). This preference is significantly less common among the Traditional and Precarious milieus (see Figure 16).

4.3 The endangerment and protection of nature

Large parts of the population are angry about the endangerment of nature and emphasise that it is our responsibility to protect nature.

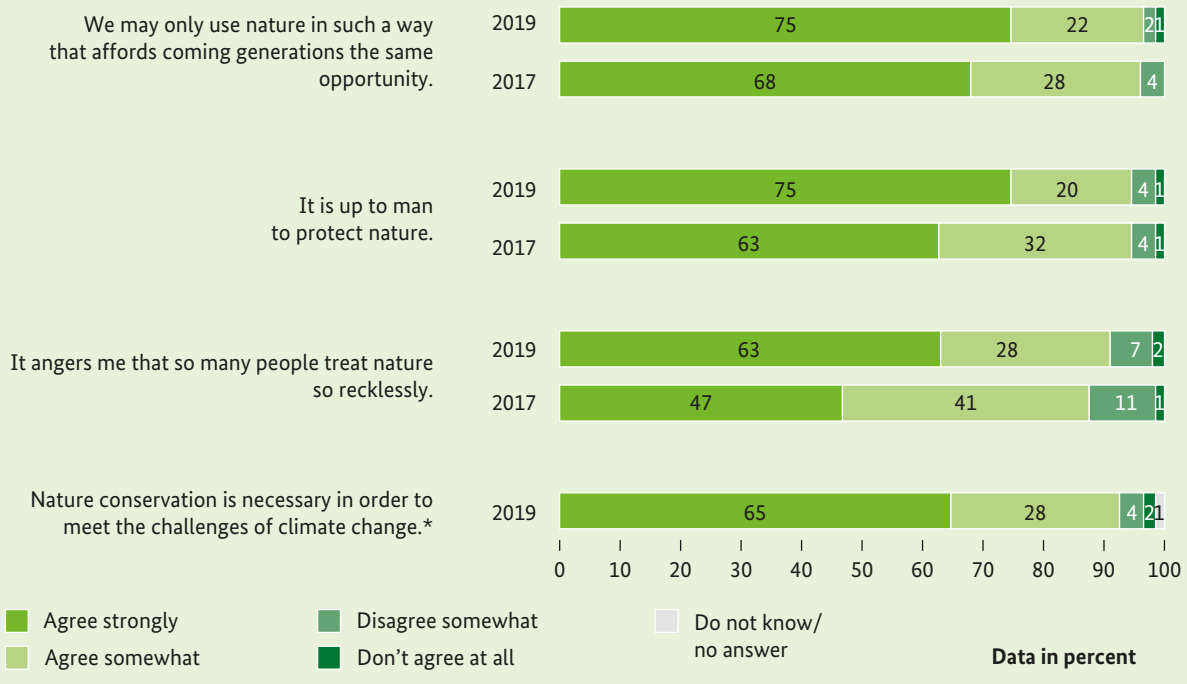
91 percent of Germans are angry about the destruction of nature in 2019 (both approval levels). 95 percent agree strongly or somewhat agree that it is our duty to protect nature. 97 percent believe that nature should only be used in such a way that future generations will be able to do the same, and 93 percent say that nature conservation is necessary in order to meet the challenges of climate change (see Figure 17). Agreement with this statement was measured for the first time in 2019: Almost two-thirds of respondents answered emphatically ("agree strongly", 65 percent) and thus clearly show recognition that nature conservation can make a contribution towards climate protection and climate adaptation. The connection between climate change and nature conservation has been the national and international focus of the work and research of the BMU and BfN for years now.

When comparing the age groups, it is noticeable that the under-30s are significantly less vehement about their support for these questions than older respondents. The only exception is the question of the importance of nature conservation in combating climate change (see Table 9).

Response behaviour over time is noteworthy: The number of respondents who emphatically agree with these statements has increased over the years (Figure 17). In 2019, 63 percent are "completely" outraged that many people treat nature with such little care,

Figure 17: Attitudes towards the endangerment and protection of nature in 2019 and 2017

For each of the following statements, please tell me whether you agree that, in your opinion, the statement applies: I completely agree, somewhat agree, somewhat disagree or completely disagree.



** New survey 2019*

Table 9: Attitudes towards the endangerment and protection of nature in 2019 by age

For each of the following statements, please tell me whether you agree with it strongly, somewhat, not really or not at all.

Response category: Agree strongly Data in percent	Average	Age (years)			
	Ø	up to 29	30 to 49	50 to 65	over 65
We may only use nature in such a way that affords coming generations the same opportunity.	75	64	75	77	78
It is up to man to protect nature.	75	68	73	80	76
Nature conservation is necessary in order to meet the challenges of climate change.	65	65	63	67	66
It angers me that so many people treat nature so recklessly.	63	55	60	68	68

Over-represented Heavily under-represented

compared to just 47 percent in 2017. The opinion that nature should only be used in such a way that future generations will be able to do the same has increased over time ("agree strongly", 2017: 68 percent, 2019: 75 percent).

The proportion of people who are completely convinced that it is our responsibility to protect nature is also continuously increasing and reached 75 percent in 2019. In 2017, just 63 percent were of this opinion, and in 2009, it was only 54 percent (see Table 10). Even if the unreserved approval of the younger generation is consistently lowest compared to the population average all the way back to 2009, there has been a noticeable increase in the approval figures in this age group during the observed 10-year period: In 2009, 48 percent of the under-30s thought it was human duty to protect nature. In the current survey there was agreement of 68 percent, which is significantly more.

Calls to protect nature meet with great approval, especially among the Liberal-Intellectual and Socio-Ecological milieus.

If one looks at the findings by social milieu, a clear pattern can be seen. For all four of the statements put

Table 10: Attitude towards nature conservation as a human obligation by age, compared over time from 2009 to 2019

It is up to man to protect nature.

Response category: Agree strongly Data in percent	Average	Age (years)			
	Ø	up to 29	30 to 49	50 to 65	over 65
2019	75	68	73	80	76
2017	63	52	62	68	65
2015	60	48	58	68	62
2013	56	53	56	56	59
2011	59	54	60	60	65
2009	54	48	53	55	58

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

Table 11: Attitudes towards the endangerment and protection of nature by milieu

Please tell me for each of these statements whether you agree with it strongly, somewhat, not really or not at all.

Response category: Agree strongly Data in percent	Average	Established Conservative milieu	Liberal-Intellectual milieu	High Achiever milieu	Movers and Shakers milieu	Adaptive Pragmatist milieu	Socio-Ecological milieu	New Middle Class milieu	Traditional milieu	Precarious milieu	Escapist milieu
We may only use nature in such a way that affords coming generations the same opportunity.	75	79	92	75	70	73	89	78	82	72	55
It is up to man to protect nature.	75	77	87	74	75	74	89	79	78	74	57
Nature conservation is necessary in order to meet the challenges of climate change.	65	70	79	70	63	71	77	63	64	57	52
It angers me that so many people treat nature so recklessly.	63	65	75	62	55	65	80	69	63	60	51

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

forth, unreserved approval is highest among the nature-loving Liberal-Intellectual and Socio-Ecological milieus. Even in the conservative Traditional milieu, oriented towards frugality and order, demand for the sustainable exploitation of nature finds above-average approval (see Table 11). In contrast, the lowest values by far are found in the fun and experience-oriented Escapist milieu. Detailed analysis also shows: Anger about the careless treatment of nature is comparatively low in the young and creative Movers and Shakers milieu. The opinion that nature conservation is necessary in order to meet the challenges of climate change is below-average in the socially weaker Precarious milieu.

4.4 Nature conservation caught between politics and economics

Only a minority attach greater importance to economic development than to nature.

26 percent of respondents surveyed in 2019 think that nature should not stand in the way of economic

Figure 18: Nature conservation caught between politics and economics over time

Please tell me for each of these statements whether you agree with it strongly, somewhat, not really or not at all.

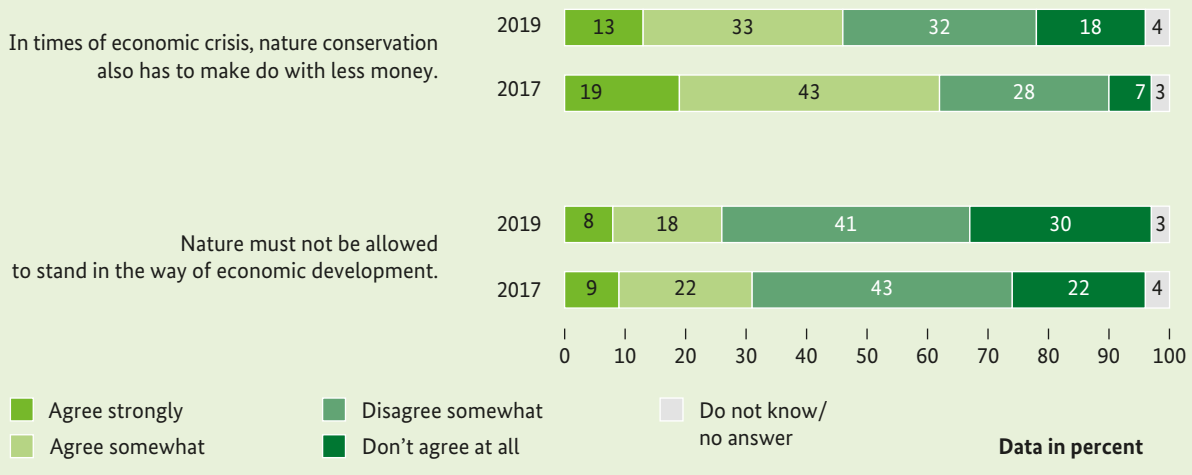
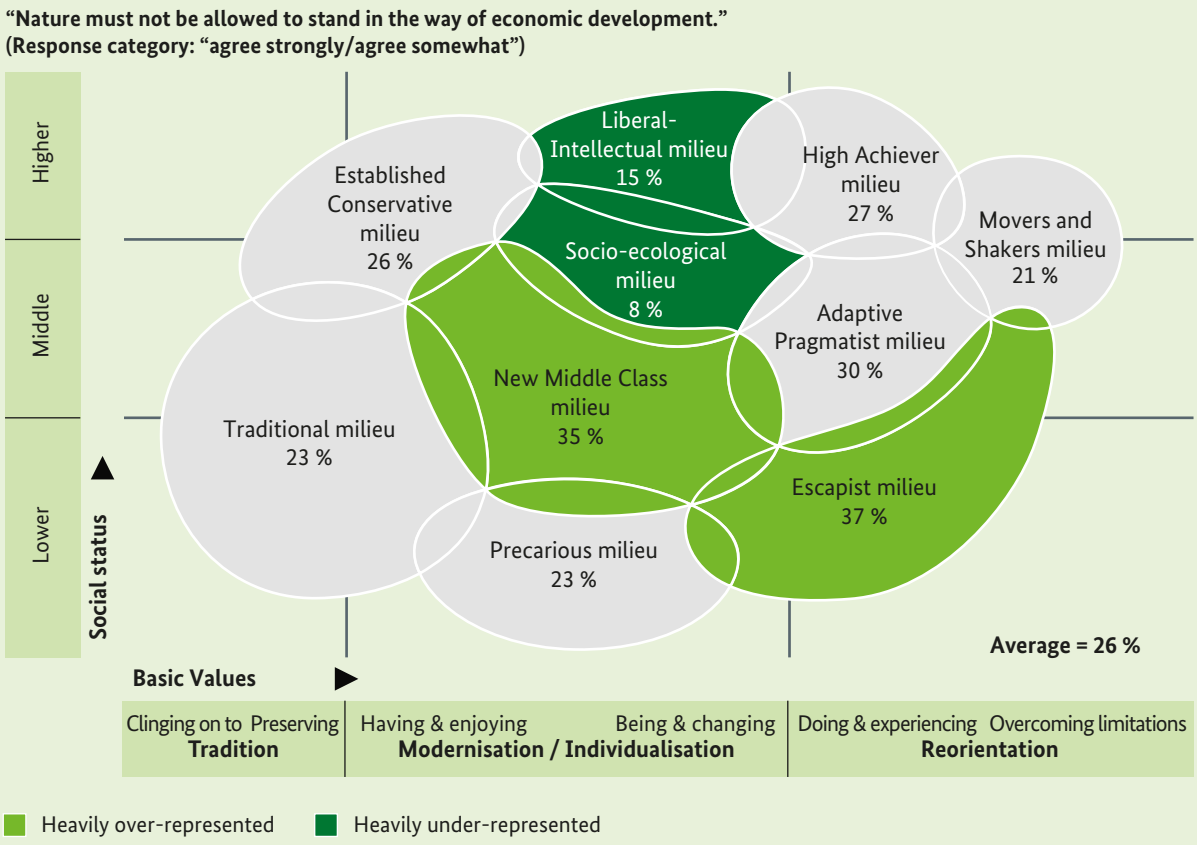


Figure 19: Nature conservation caught between politics and economics by Sinus milieu



development (both positive approval levels, see Figure 18). The overwhelming majority of 71 percent do not share this opinion (response categories: "disagree somewhat" and "don't agree at all"). When asked whether nature conservation should have to get by with less money during times of economic crisis, 46 percent answered "yes" or "somewhat yes" in 2019, but those who answered this question negatively, even if only barely, are in the majority ("disagree somewhat" / "don't agree at all": 50 percent). The majority of the formally well-educated and financially well-off part of the population disagree with the question of whether or not nature conservation must cut back during times of economic crisis (high level of formal education: 57 percent, net household income starting at 3,500 euros: 59 percent).

Once again, comparison over time is interesting because it clearly shows how public opinion, caught between nature conservation and the economy, has significantly shifted towards nature conservation: In 2017, the proportion of those who assigned greater importance to economic development than nature was 31 percent. In the current survey it is 26 percent. Even in times of crisis, the opinion of 62 percent of respondents at that time was that nature conservation would have to get by with less money, whereas less than half expressed this opinion in 2019 (see Figure 18).

Nature conservation is given priority over economic development, especially in the Socio-Ecological and Liberal-Intellectual milieus.

At 15 percent approval, significantly fewer Liberal-Intellectuals than the population average (both approval levels: 26 percent) believe that nature must not stand in the way of economic development, while in the Socio-Ecological milieu, only eight percent agree. Conversely, the highest approval values come from the ranks of the Escapist milieu and the New Middle Class milieu (see Figure 19). An above-average number of the Escapist milieu agree that nature conservation must get by with less money during times of economic crisis (both approval levels: 54 percent), while the lowest approval ratings are once again found in the Socio-Ecological milieu (31 percent).

5 Renewable energies – on the way to a community project

The year 2019 was marked by an intensification of the energy and climate policy debate in Germany. Here, as in many other countries, the "Fridays for Future" movement has made its voice heard calling for greater and more consistent climate protection – on 20th September 2019, 1.4 million people demonstrated at 500 events in Germany alone. This shows that ecological issues in general, climate protection and preserving biodiversity in particular are of concern to large sections of society – and therefore to the younger generation. According to a study carried out by SINUS in June 2019, ten percent of 14 to 24-year-olds attended a "Fridays for Future" demonstration at least once, but their concerns and goals are shared by a large majority of this generation (see SINUS 2019).

On the other hand, however, it is evident that protests against energy transition projects have increased in their scope and intensity, at least at the local level.

How does this intensification and polarisation of the energy and climate policy debate affect the opinions of the German people? The nature awareness study has been continually following the topic of the energy transition since 2011, the year in which the federal government decided to phase out nuclear energy. The results of the current survey are presented below.

5.1 Energy transition

Approval and rejection of the energy revolution has changed very little in recent years.

As in previous years, a clear majority (60 percent) of respondents in 2019 think the energy transition is right, whereas only eight percent think it is wrong. The proportion of those who are undecided is also stable at 29 percent (see Figure 20).

Approval of the energy transition in large towns with a population of over 500,000 and among high earners (net household income starting at 3,500 euros) is above-average (65 percent and 68 percent); it also increases with the level of education (low education level: 55 percent, average education level: 61 percent, high education level: 65 percent). With regard to local protests, it should be noted that general approval of the energy transition does not preclude people from deciding in a specific case against a wind turbine or

Figure 20: Approval and rejection of the energy transition compared over time

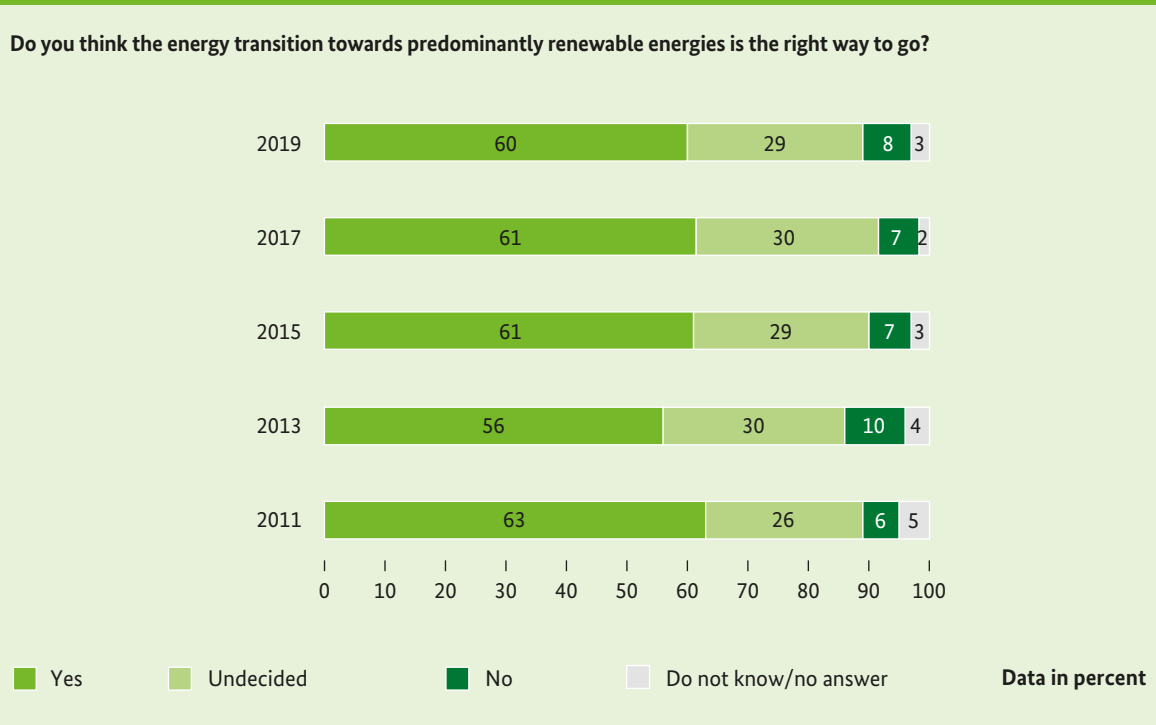


Table 12: Approval and rejection of the energy transition in a time comparison by social milieu

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

Response category: **Yes** Data in percent	Average	Established Conservative milieu	Liberal-Intellectual milieu	High Achiever milieu	Movers and Shakers milieu	Adaptive Pragmatist milieu	Socio-Ecological milieu	New Middle Class milieu	Traditional milieu	Precarious milieu	Escapist milieu
2019	60	63	71	68	65	69	64	57	57	55	47
2017	61	69	79	63	70	65	74	60	52	53	48
2015	61	69	78	61	75	70	74	59	50	48	51
2013	56	66	72	65	69	63	81	53	45	33	45
2011	63	72	83	61	72	70	84	62	61	47	45

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

the pipe routing of the network expansion in an area. The extent to which the general attitude towards the energy transition affects the acceptance of local projects depends on a variety of other factors – for example, the question of the economic benefits to the region, trust in project planning, the avoidance of negative effects on people and nature, as well as the opinion of others (social norms) (see Hübner et al. 2019).

The milieu-specific differences in support of the energy transition have decreased.

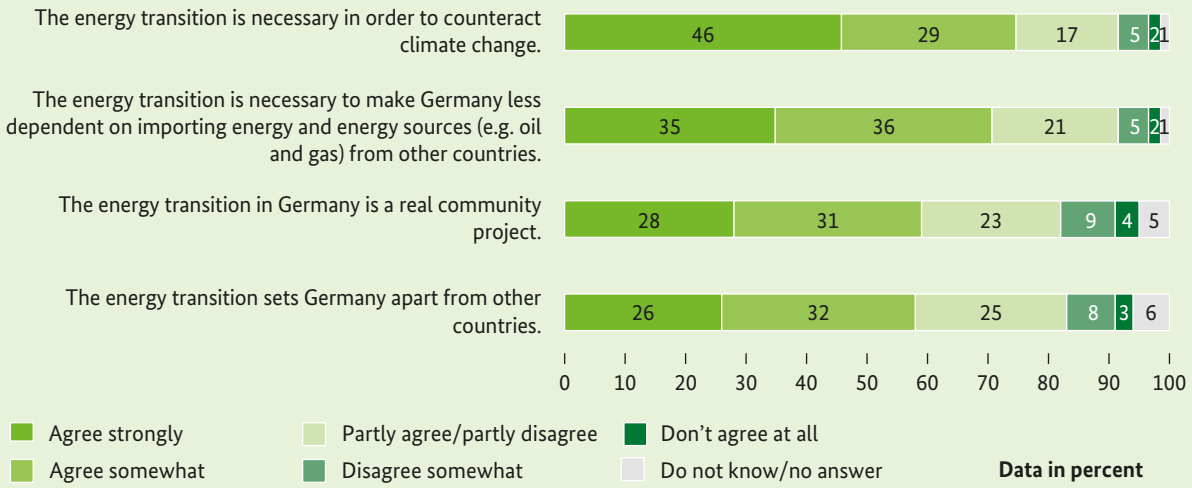
The highest number of supporters of the energy transition can be found in the Liberal-Intellectual and Adaptive Pragmatist milieus (71 percent and 69 percent "yes" responses). The least support comes from the Escapist milieu (47 percent "yes" responses). It is noticeable that the energy transition has lost support among several of the upscale milieus since the last survey. This is especially true among the Liberal-Intellectuals (2017: 79 percent "yes" responses, 2019: 71 percent) and the Socio-Ecological milieu (2017: 74 percent "yes" responses, 2019: 64 percent). On the other hand, the energy transition has gained popularity among the Traditional, Adaptive Pragmatist and High Achiever milieus (see Table 12).

A comparable change was last seen in the 2013 Nature Awareness Study, albeit in the opposite direction: Compared to the 2011 values, the energy transition was able to "score" among the higher class milieus, which led to stronger higher-lower polarisation of approval. Interpreted in a positive way, the decrease in the milieu-specific discrepancies in approval in 2019 could bring the (social) community character of the energy transition back to the fore. These current findings can be better classified against the background of the results of the social sustainability barometer on the energy transition (Setton et al. 2019), which was carried out for the second time in 2018. This barometer study also found continued high acceptance of the energy transition, although criticism of the implementation of the energy transition had increased significantly since 2017. The main objections are the high costs, the inadequate consideration of social justice and a contribution towards climate protection that is deemed insufficient. Spatial distribution of energy plants is perceived as unfair, while unclear energy policy agreements between federal states can lead to misunderstandings and conflicts (see Hübner et al. 2019).

But what exactly does the energy transition really stand for, why is it necessary, and what characterises it? In order to get an initial idea of the "framing" of the energy transition political megaproject in people's minds, the respondents were presented with four statements that aim at capturing lines of argument and special features (see Figure 21).

Figure 21: Attitudes towards the energy transition

Please rate the following statements on the energy transition.



Three-quarters are of the opinion that the energy transition is necessary in order to counteract climate change.

75 percent of respondents are of the opinion that the energy transition is necessary in order to counteract climate change; 46 percent "agree strongly" with this opinion. The justification that the energy transition will make Germany less dependent on the import of fossil fuels is also very popular. 35 percent agree unreservedly with this line of argument, while another 36 percent "somewhat" agree with it.

When asked to what extent the energy transition is a "genuine community project", overall approval was more restrained (both approval levels: 59 percent), with the greatest approval being recorded in the highest income group (highest approval level: 34 percent, average: 28 percent). The situation is similar when it comes to the question of whether the energy transition distinguishes Germany on an international level: 58 percent agree with this, including 26 percent "strongly". Among the financially well-off, 32 percent unreservedly agree with this statement.[18]

When comparing milieus, it is particularly noticeable that the energy transition is by far the most mentioned as a necessary measure to fight climate change by the Liberal-Intellectuals: 65 percent of respondents in this milieu agree unreservedly with this statement. In comparison, it is only 37 percent in the Escapist milieu and just 30 percent in the Precarious milieu.

5.2 Acceptance of landscape-altering measures

In addition to the general approval or rejection of the energy transition, questions were also asked about how people rate the effects of different renewable energy options that cause change to landscape. The term "landscape" includes not only the visual impression, but also dimensions such as noise or smell.

Overhead power lines and felling of forest and woodland are largely rejected.

It turns out that the majority of people would support or at least accept options with comparatively low "depth of interference" in the landscape. Solar panel systems on buildings receive the highest level of approval ("I think this is good" / "I would accept": 93 percent), followed by underground cables (78 percent), offshore wind turbines (78 percent) and wind turbines on the coast (76 percent). Around 70 percent approve of both on-shore wind turbines and rapeseed cultivation. The cultivation of maize is supported or accepted by 65 percent of respondents. Biogas systems and solar panel systems on meadows and fields are in the lower mid-range of approval ratings with 61 percent each. Overhead power lines (38 percent) and felling of forest and woodland (22 percent) are far behind at the bottom of the rankings.

Clear socio-demographic differences can be seen at the highest approval levels ("I think this is good"):

Wind turbines on the coast are rated as good by the highest income group more than average. Rapeseed and maize cultivation is particularly popular among the younger generation. Approval of wind turbines on land is above-average in the highest income group, decreases with age and increases with level of formal education. The situation is similar among supporters of solar panel systems on meadows and fields - it decreases with age and increases with level of formal education (see Table 13).

In addition to age, education and income, the size of the town also plays a role. Solar panel systems on buildings and underground cables are most frequently supported in large towns ("I think this is good": Population over 500,000: 64 percent and 36 percent, average: 58 percent and 30 percent). It is also noticeable that the cultivation of rapeseed and maize as well as the possible installation of solar panel systems on meadows and fields are least popular in smaller towns (population 5,000 to 20,000) and villages (population below 5,000) (rapeseed cultivation: 17 percent and 16 percent; maize cultivation: 14 percent and eight percent; solar panel systems on meadows and pastures: 16 percent and nine percent).

In contrast to the socio-demographic analysis, the milieu analysis shows greater differences when looking at both levels of approval ("I think this is good" / "I would accept this"). The findings on onshore wind

Figure 22: Acceptance of landscape-altering measures to produce renewable energies

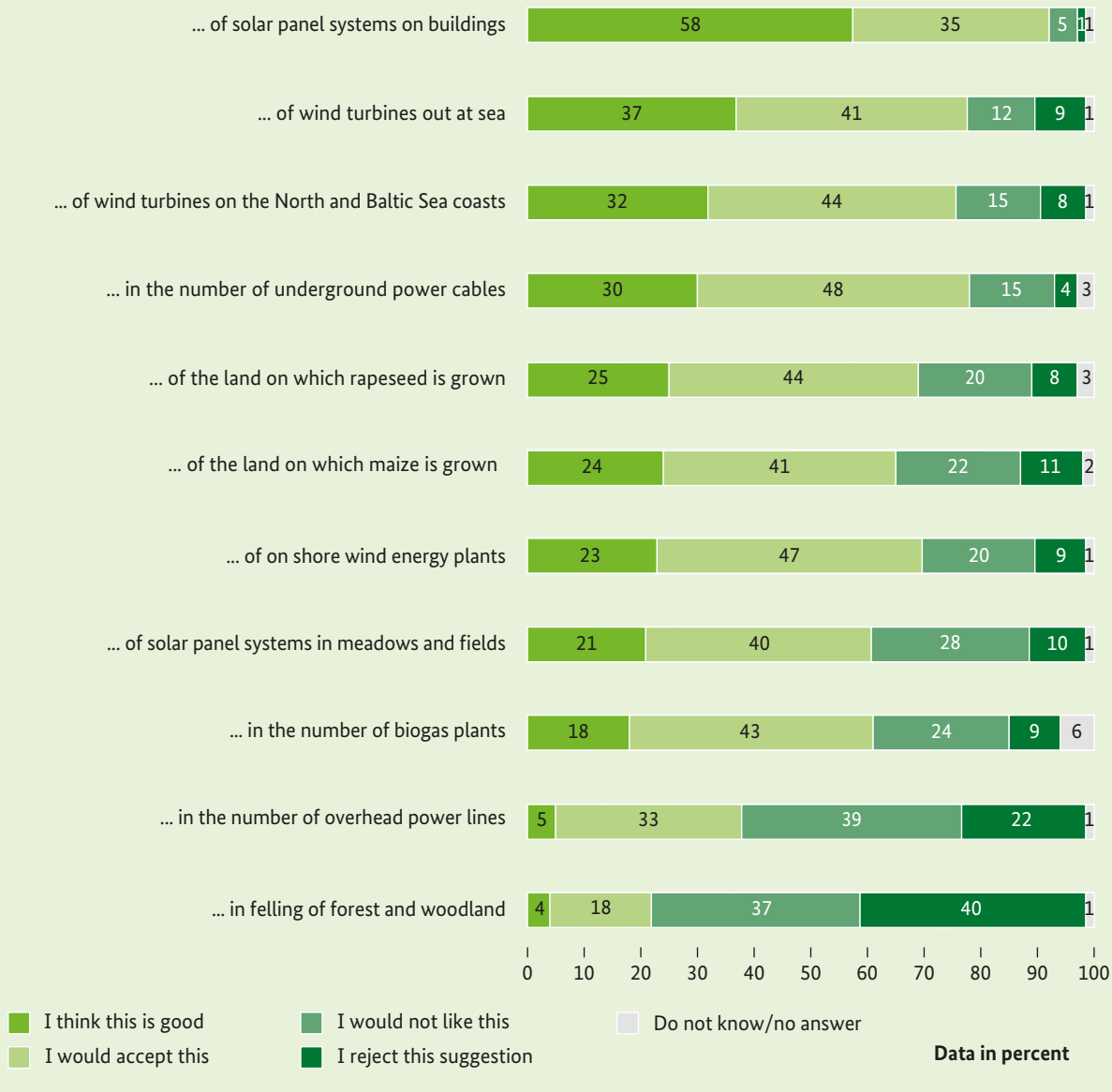


Table 13: Acceptance of landscape-altering measures to produce renewable energies by age, education and income

If we use more renewable energies in the future, it will lead to changes in our landscape. How do you evaluate the possible increase ...?

Response category: I think this is good Data in percent	Aver-age	Age (years)				Education			Net household income (€)			
	Ø	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
... of solar panel systems on buildings	58	61	60	56	54	54	57	61	60	58	56	60
... of wind turbines out at sea	37	41	35	34	40	39	37	34	33	33	39	38
... of wind turbines on the North and Baltic Sea coasts	32	36	31	32	31	32	31	33	32	29	31	37
... in the number of under-ground power cables	30	29	31	29	32	31	29	30	25	31	31	30
... of the land on which rape-seed is grown	25	34	26	22	23	26	24	26	27	25	26	24
... of the land on which maize is grown	24	30	24	21	24	26	21	25	19	24	26	22
... of on shore wind energy plants	23	32	23	22	18	19	20	29	22	20	22	28
... of solar panel systems on meadows and fields	21	26	24	19	17	18	20	25	13	22	22	22
... in the number of biogas plants	18	22	18	17	17	18	18	18	25	17	19	18
... in the number of overhead power lines	5	6	6	3	5	6	3	5	5	4	6	4
... in felling of forest and woodland	4	4	4	3	4	3	2	5	3	3	3	5

Heavily over-represented Over-represented Under-represented

power (see Table 14) are particularly interesting: the most important "supporter" milieus for onshore wind power are the Movers and Shakers (75 percent), the High Achievers (76 percent) and the Adaptive Pragmatist milieus (78 percent). While 70 percent of all respondents think an increase in onshore wind power is good or would accept it, only 64 percent of the New Middle Class milieu and just 57 percent of the Socio-Ecological milieu agree. The era in which a wind turbine was an expression of an alternative ecological stance is evidently finally over. These figures also emphasise the already mentioned finding of a certain "normalisation" of the energy transition – that is, its move from the "heartfelt concern" of particularly ecologically-minded milieus to a socially more broadly based community project that is viewed more pragmatically and is less disputed. It remains to be seen whether and how the aforementioned latest polarisation of the social energy and climate debate will affect the attitudes of the population towards the energy transition in the medium term.

Table 14: Acceptance of landscape-altering measures to produce renewable energies by social milieu

If we use more renewable energies in the future, it will lead to changes in our landscape. How do you evaluate the possible increase ...?

Response category: I think this is good/I would accept this Data in percent	Average	Established Conservative milieu	Liberal-Intellectual milieu	High Achiever milieu	Movers and Shakers milieu	Adaptive Pragmatist milieu	Socio-Ecological milieu	New Middle Class milieu	Traditional milieu	Precarious milieu	Escapist milieu
... of solar panel systems on buildings	93	94	97	94	91	93	94	94	96	92	89
... of wind turbines out at sea	78	82	83	78	78	80	71	77	76	78	75
... of wind turbines on the North and Baltic Sea coasts	76	79	79	84	75	84	64	74	74	75	73
... in the number of underground power cables	78	81	84	74	71	75	81	83	75	78	78
... of the land on which rapeseed is grown	69	66	58	77	75	77	64	73	72	56	69
... of the land on which maize is grown	65	63	52	76	70	74	56	69	65	53	66
... of on shore wind energy plants	70	72	73	76	75	78	57	64	66	67	73
... of solar panel systems on meadows and fields	61	66	57	66	68	65	58	55	56	56	62
... in the number of biogas plants	61	65	58	68	55	59	54	63	56	66	65
... in the number of overhead power lines	37	41	27	40	36	45	33	33	34	33	45
... in felling of forest and woodland	21	22	12	24	28	19	16	16	21	16	31

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

6 Agro-genetic engineering and new genetic engineering processes in nature conservation

The issue concerning the social acceptance of agro-genetic engineering and new genetic engineering processes is highly topical for nature conservation. "Genetic engineering" refers to processes by which the genetic material of organisms is modified using molecular biological techniques. This causes hereditary changes in the properties of the organisms, which would usually not be possible in natural reproduction and conventional breeding. In recent years, in addition to advancing digitisation and breakthroughs in molecular biological research, new processes in genetic engineering have emerged, including so-called genome editing (also referred to as "gene scissors"). Compared to previous genetic engineering processes, these new biotechnological tools are easier, faster, often more precise and flexible to use in organisms such as plants and animals (including wild populations), microorganisms and viruses. This increases the range of possible applications.

In agriculture, genetic engineering methods have thus far mainly been used on crops (for example maize) to modify them in such a way that they are resistant to pesticides (so that they can be used comprehensively), or so that the plants are pest-resistant (for example by making them secrete a pesticide) (see Brookes and Barfoot 2018, Lombardo et al. 2016). In addition there is, in principle, a broad range of applications for new genetic engineering methods, including in nature conservation, which ranges from the introduction of synthetic genes to increasing variation in the gene pool, through to the production of "nature-identical" versions of extinct species. These new and expanded applications raise a number of conceptual, legal and ethical questions that require broad social discourse.

How do people rate the possibilities of agro-genetic engineering, especially the new genetic engineering processes? What do they think of the promise of genetic engineering ending world hunger? Would they like genetic engineering processes to be used in wild organisms? Do they trust what science says about the safety of genome editing? Would they themselves be prepared to eat genetically modified food? Would they like food created using genetically modified feed to be labelled? What kind of legislative handling would they like to see with agro-genetic engineering? This chapter provides answers to these and other questions.

6.1 Genetic engineering in agriculture

Four out of five Germans reject genetic engineering in agriculture.

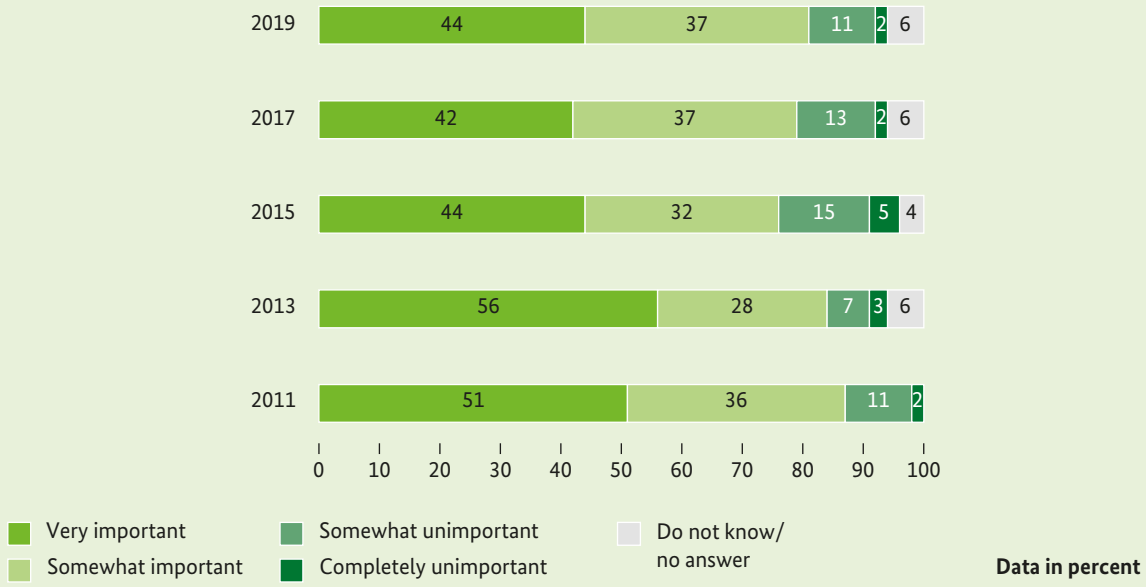
In this present study, Germans were asked whether a ban on genetically modified organisms is important to them for the fifth time over a period of ten years. Accordingly, 81 percent of respondents are in favour of a ban on genetic engineering in agriculture ("very important": 44 percent, "somewhat important": 37 percent). Eleven percent consider such a ban to be "somewhat unimportant", while only two percent consider it "completely unimportant" (see Figure 23). As in the previous studies, this once again clearly shows that the population largely rejects genetic engineering in agriculture.

When assessing a ban on genetic engineering in agriculture, neither the educational background nor the income of the respondents are decisive. This corresponds with the results from 2017. Town size also has no influence on response behaviour. Age and gender play a certain, albeit not a large role. Unreserved approval for a ban increases with age (under-30s: 39 percent, 30 to 49 years of age: 42 percent, 50 to 65 years of age: 46 percent, over-65s: 48 percent). In addition, women are more likely than men to consider a ban "very important" (48 percent and 40 percent respectively).

In a milieu comparison, it is noticeable that respondents who voted unreservedly in favour of a ban in 2019 are over-represented in the nature conservation-oriented Socio-Ecological milieu ("very important": 56 percent). In contrast, they are under-represented in the fun and experience-oriented Escapist milieu (38 percent), as well as in the neo-liberal and

Figure 23: Agreement with the banning of genetically modified organisms in farming

Please tell me whether you find the following measures very important, somewhat important, somewhat unimportant or completely unimportant: The use of genetically modified organisms in farming will be banned.



efficiency-oriented High Achiever milieu (32 percent). When comparing study results over time, the unreserved approval for a ban decreased in all milieus between 2013 and 2017, but this clear pattern has not continued in 2019. There was further decrease in approval of a ban among the High Achievers (2017: 40 percent, eight percent lower in 2019) and in the Socio-Ecological milieu (2017: 61 percent, five percent lower in 2019). The opposite is true in the Established Conservative, Movers and Shakers, Adaptive Pragmatist and Precarious milieus, in which the approval values have increased by at least six percentage points in two years (see Table 15). In the other milieus, approval of the ban on genetic engineering in agriculture is relatively stable compared to the 2017 figures (Liberal-Intellectual, New Middle Class milieu, Traditional milieu and Escapist milieu).

Table 15: Agreement with the banning of genetically modified organisms in farming by milieu as compared over time*

Please tell me whether you find the following measures very important, somewhat important, somewhat unimportant or completely unimportant: The use of genetically modified organisms in farming will be banned.

Response category: very important Data in percent	Average	Established Conservative milieu	Liberal-Intellectual milieu	High Achiever milieu	Movers and Shakers milieu	Adaptive Pragmatist milieu	Socio-Ecological milieu	New Middle Class milieu	Traditional milieu	Precarious milieu	Escapist milieu
2019	44	42	51	32	41	40	56	50	50	46	38
2017	42	36	52	40	34	33	61	50	48	39	36
2015	44	47	57	37	41	43	67	43	50	35	34
2013	56	63	75	56	58	44	77	57	52	50	45

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

* This question was not asked in 2011; for 2009, the results refer back to the milieus used prior to the last milieu model update and therefore are not readily comparable.

The demand for mandatory labelling has increased significantly.

No genetically modified organisms are grown in Germany. However, foods are sold that contain genetically modified components; these are labelled throughout the EU. Genetically modified animal feed is also labelled. There is currently no labelling requirement for products made from animals that have been fed genetically modified products. The respondents call for this type of labelling: 95 percent of respondents are "strongly" or "somewhat" in favour of industry having to label food from animals that have been fed genetically modified feed (see Figure 24). The **unreserved demand for mandatory labelling has significantly increased compared to the previous study**: In 2017, 69 percent were "strongly" in favour of mandatory labelling, while in the current survey it is 79 percent, and even 84 percent among the 50 to 65 age group.

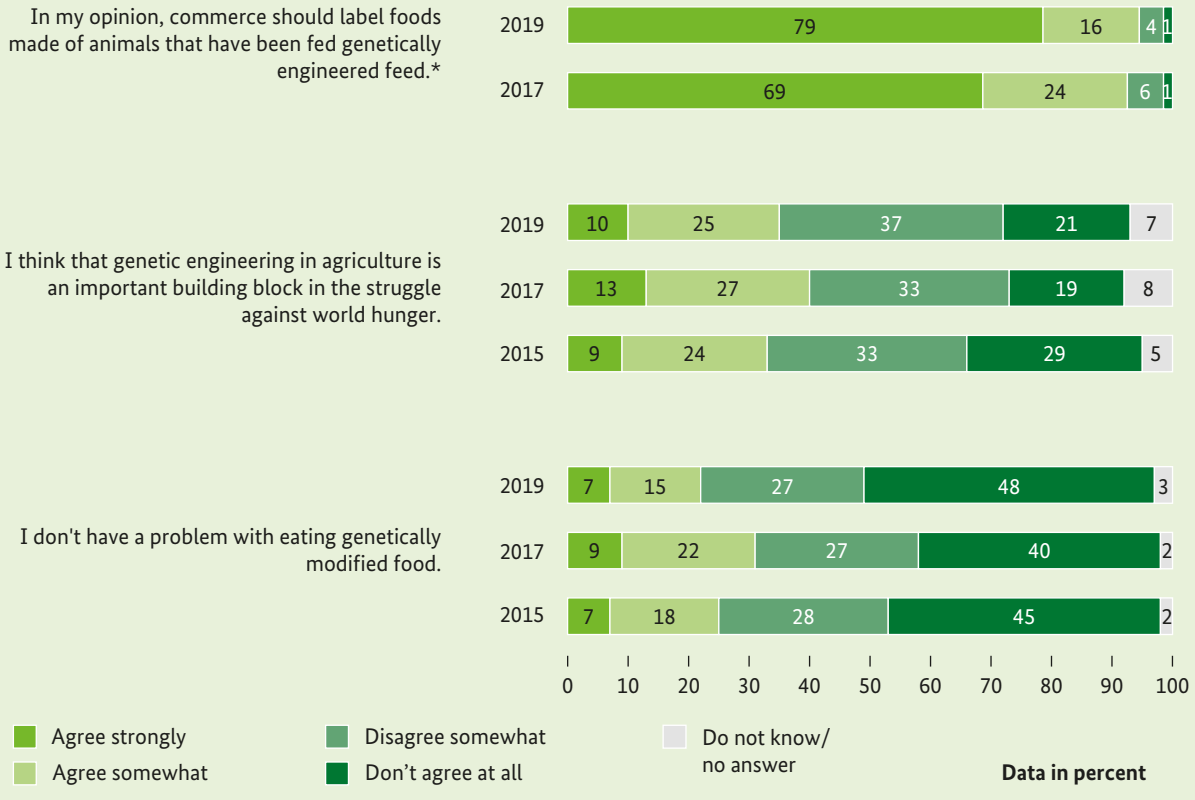
The majority does not agree with the argument that genetic engineering in agriculture is an important element in combating global hunger. The proportion of those who disagree with this argument has increased six percentage points since 2017 ("disagree somewhat"/"don't agree at all": 2017: 52 percent, 2019: 58 percent). In 2015, however, this figure was somewhat higher (62 percent). Men are more likely than women to accept this argument (both approval levels: 39 percent compared to 30 percent), however, the greatest level of approval comes from the financially well-off group (net household income starting at 3,500 euros: 42 percent).

Concerns about genetically engineered food have increased again: In the 2017 study, 31 percent said that they consider eating genetically engineered foods to be no problem or a somewhat insignificant problem. In the current study, only 22 percent agree; in 2015 it was 25 percent. Under-30s and men are still most likely to say they consider eating genetically modified food to be no problem or a somewhat insignificant problem (28 percent each), while women are far more critical (16 percent).

Large differences can be observed in the response behaviour of the social milieus: The Socio-Ecological and Liberal-Intellectual milieus have the strongest

Figure 24: Attitudes towards the deployment of genetic engineering in agriculture over time

Please assess the following statements on the topic of genetic engineering in agriculture.



** This item was not queried in 2015.*

reservations about genetic engineering. Compared to all the other lifeworlds, members of these milieus are the most likely to demand that food from animals that have been fed genetically modified feed be labelled by commerce (highest approval level: Socio-Ecological: 89 percent, Liberal-Intellectual: 88 percent). The argument that genetic engineering in agriculture is an important element in combating global hunger is also lowest in these lifeworlds (both approval levels: Liberal-Intellectuals: 25 percent, Socio-Ecological: 20 percent). In addition, concerns about genetically modified foods are highest in these milieus – only 14 percent of the Liberal-Intellectuals and eleven percent of the Socio-Ecological milieu consider eating genetically engineered foods to be no problem or a somewhat insignificant problem (average: 22 percent). In comparison, reservations about genetic engineering are significantly lower in the Escapist milieu. Although mandatory labelling is called for by a clear majority of the Escapist milieu, unreserved approval ratings are significantly below the average (61 percent compared to 79 percent on average). Furthermore, the argument that genetic engineering in agriculture is an important element in the fight against global hunger is approved of more than average in the Escapist milieu (both levels of approval: 47 percent, average: 35 percent). In addition, 36 percent of the Escapist milieu say that they consider eating genetically modified food to be no problem or a somewhat insignificant problem.

6.2 New genetic engineering processes

There is also great scepticism towards new processes in genetic engineering: Almost all Germans are of the opinion that the possible impact on nature must be investigated.

The emphasis on the precautionary principle in new genetic engineering processes is expressed by the fact that 95 percent of respondents are of the opinion that the possible impact on nature must always be investigated when plants are genetically modified using new processes (both levels of approval, see Figure 25). Four out of five respondents "strongly" agree with this requirement. Approval is particularly high among the 50 to 65-year-olds (both levels of approval: 95 percent, highest level of approval: 84 percent, see Table 16).

In addition, almost 90 percent of Germans doubt that the long-term consequences of new genetic engineering processes can currently be foreseen.

Regardless of gender, age, education and income, nine out of ten respondents cannot imagine that the long-term consequences of new genetic engineering processes can be assessed yet (highest level of approval: 63 percent, both levels of approval: 88 percent). This is particularly emphasised by respondents who live in rural areas (population below 5,000: highest level of approval: 76 percent, both levels of approval: 96 percent). On the other hand, approval is below-average in large cities with a population of 100,000 to 500,000 (highest level of approval: 58 percent, both levels of approval: 84 percent).

This finding coincides with an **unusually low level of trust in statements made by scientists that new genetic engineering processes are safe** (only eight percent "strongly" agree and a further 28 percent "somewhat" agree). Once again, there are no differences in response behaviour by gender, age, education and income. This finding also emphasises the relevance of the precautionary principle for new genetic engineering processes.

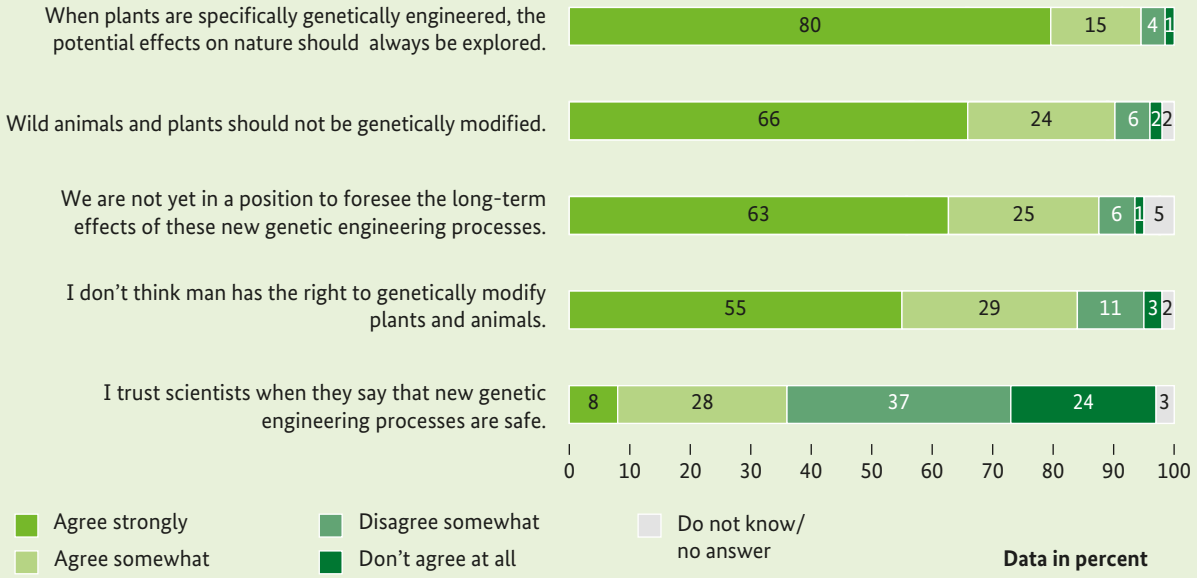
Over 80 percent express ethical reservations about the targeted genetic manipulation of plants and animals.

In addition to the lack of trust in the reliability of science with regard to the possible consequences of new genetic engineering processes, the respondents also expressed ethical concerns: A majority of 84 percent believe that human beings have no right to genetically modify plants and animals (both levels of approval, highest level of approval: 55 percent). Ethical concerns are most commonly voiced by the oldest respondents (over-65s both levels of approval: 86 percent, highest level of approval: 62 percent). It is also noticeable that women often have greater concerns than men (women: both levels of approval: 86 percent, highest level of approval: 60 percent; men: both levels of approval: 81 percent, highest level of approval: 49 percent).

Furthermore, the **targeted genetic engineering of plants and animals from the wild is rejected by 90 percent of the German public** (66 percent "strongly" and a further 24 percent "somewhat", see Figure 26).

Figure 25: Attitudes towards the new genetic engineering processes

We would now like to ask you some general questions on the new genetic engineering processes. These new processes make it possible, for example, to switch genetic material on and off or to rewrite it, and to combine genetic material in a targeted way using the modular principle. In the press, these processes are also referred to as Genome Editing, CRISPR/Cas or gene scissors. To what extent do you agree with the following statements?



This finding also applies to currently discussed research agendas, according to which wild populations are to be genetically modified with so-called "gene drives" (see Steinbrecher and Wells 2019) in order to be able to combat disease carriers or invasive species. Targeted genetic engineering is particularly rejected in rural areas (highest level of approval: 78 percent in areas with a population of less than 5,000). In addition, the older the respondents, the greater the level of rejection (see Table 16).

It is primarily the Socio-Ecological, Liberal-Intellectual and Traditional milieus who have the greatest ethical concerns.

The greatest level of criticism for new genetic engineering processes also comes from the ranks of the Socio-Ecological and Liberal-Intellectual milieus. In the Traditional milieu it is primarily the ethical argument that gains the greatest level of approval. 64 percent of Traditionals fully agree that humans have no right to genetically engineer plants and animals; the average of those surveyed is 55 percent (see Table 17). Once again, the Escapist milieu has the fewest reservations. For example, members of this milieu put far less emphasis on ethical concerns than members of other milieus. Nevertheless, scepticism towards new processes in genetic engineering is still widespread, also among the Escapist milieu. At least 41 of the Escapist milieu "strongly" agree that human beings have no right to genetically modify plants and animals (average: 55 percent), while another 36 percent "somewhat" agree with this opinion.

The response behaviour of the High Achiever milieu is also striking. The rejection of the targeted genetic engineering of nature is less pronounced in the High Achiever milieu than the average (highest level of approval: High Achiever milieu: 57 percent, average: 66; both levels of approval: High Achiever milieu: 91 percent). In addition, no other milieu shows a higher level of trust in the safety of new genetic engineering processes if this is confirmed by science than the Performers (highest level of approval: 16 percent, both levels of approval: 47 percent).

Overall, the findings show that the surveyed attitudes towards new processes in genetic engineering are relatively evenly pronounced among the population. Only a few differences can be identified in the socio-demographic analysis. The differences by milieu are far greater, although this only applies to unreserved approval. When considering both levels of approval, it becomes clear that: With the exception of the Escapist milieu, fundamental reservations about the new genetic engineering processes are widespread in all milieus.

Table 16: Attitudes towards the new genetic engineering processes by gender, age and town size

We would now like to ask you some general questions on the new genetic engineering processes. These new processes make it possible, for example, to switch genetic material on and off or to rewrite it, and to combine genetic material in a targeted way using the modular principle. In the press, these processes are also referred to as genome editing, CRISPR/Cas or gene scissors. To what extent do you agree with the following statements?

Response category: Agree strongly Data in percent	Average	Gender		Age (years)				Town size BIK 5 (in 1000)				
	Ø	M	F	up to 29	30 to 49	50 to 65	over 65	up to 5	5 to 20	20 to 100	100 to 500	over 500
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	80	80	80	76	77	84	82	75	81	81	80	80
Wild animals and plants should not be genetically modified.	66	63	69	57	62	69	73	78	60	67	66	65
We are not yet in a position to foresee the long-term effects of these new genetic engineering processes.	63	59	66	58	61	65	66	76	69	64	58	64
I don't think man has the right to genetically modify plants and animals.	55	49	60	50	52	54	62	64	49	55	55	54
I trust scientists when they say that new genetic engineering processes are safe.	8	9	6	10	7	7	7	9	5	9	11	5

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

Table 17: Attitudes towards the new genetic engineering processes by milieu

We would now like to ask you some general questions on the new genetic engineering processes. These new processes make it possible, for example, to switch genetic material on and off or to rewrite it, and to combine genetic material in a targeted way using the modular principle. In the press, these processes are also referred to as genome editing, CRISPR/Cas or gene scissors. To what extent do you agree with the following statements?

Response category: Agree strongly Data in percent	Average	Established Conservative milieu	Liberal-Intellectual milieu	High Achiever milieu	Movers and Shakers milieu	Adaptive Pragmatist milieu	Socio-Ecological milieu	New Middle Class milieu	Traditional milieu	Precarious milieu	Escapist milieu
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	80	86	89	76	79	77	93	82	85	80	65
Wild animals and plants should not be genetically modified.	66	64	81	57	62	61	81	73	74	70	50
We are not yet in a position to foresee the long-term effects of these new genetic engineering processes.	63	63	74	58	61	65	74	65	69	64	49
I don't think man has the right to genetically modify plants and animals.	55	54	63	49	54	53	64	59	64	52	41
I trust scientists when they say that new genetic engineering processes are safe.	8	7	4	16	8	6	2	8	5	6	12

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

7 Digitisation – opportunities for nature conservation

The digital revolution is in full swing. The technological developments are rapid and change the way we learn, communicate and consume – in short: how we live. Digitisation affects almost all sectors and areas of our modern society. In the economic sector, it is no longer just about IT. We are seeing new business models in all industries: Cars are shared via app, languages are learned online and music and films are streamed. Industry is also changing: 3D printers create machine parts, robots assemble them, and entire factories are intelligently networked with one another. Everything is becoming "smarter": Smart home solutions are revolutionising living and everyday life, smart city features bring citizens together, and smart farming methods are becoming widespread in the agricultural sector.

And nature conservation? In science, new possibilities for the digitisation of nature conservation have been discussed for a long time (see Arts et al. 2015). The focus here is on the considerable expansion of data availability on nature, conditions in nature, and the ways in which nature can be used, as well as the systematic evaluation, digital species identification options, participative forms of knowledge and usage, and a broadening of communication about nature and nature conservation. There are also voices that emphasise the possible negative consequences of digitisation for nature and the environment: Mining rare raw materials, energy consumption for servers, social control, substitution of real nature experiences (see Kuntsman and Rattle 2019).

Figure 26: Perception of the opportunities and risks of digitisation in general

"There is currently a lot of discussion about digitisation. Some emphasise the opportunities, others the risks. How do you personally feel about it?"

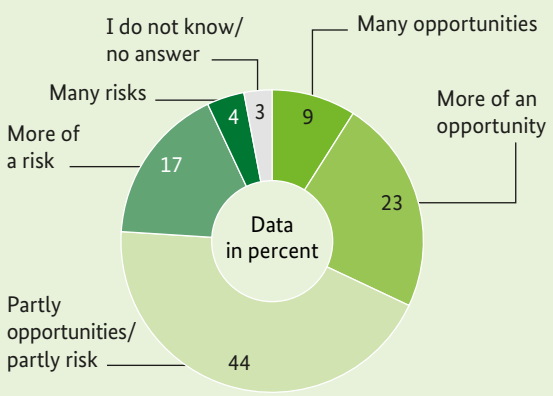
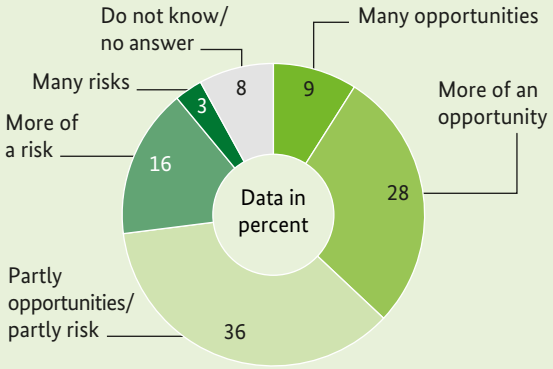


Figure 27: Perception of the opportunities and risks of digitisation in nature conservation

"And if you now think about nature conservation: Do you think that digitisation provides more opportunities or poses more risks?"



The German Advisory Council on Global Change (WBGU) also recognises these risks, but above all emphasises the opportunities that digitisation offers for supporting sustainability: Precision farming aiding sustainability, the digital monitoring of biodiversity, virtual nature experiences as a supplement to the "analogue" or the ability to combat poaching are just some of the examples they mention (see WBGU 2019). In its digitisation strategy (German government 2019), the government named five overarching spheres of activity and a wealth of specific projects that Germany intends to use to shape its digital transformation. In its environmental Digital Policy Agenda, the Federal Ministry for the Environment defines strategic goals for using digitisation to help nature, the environment and climate (BMU 2020). Digitisation is certainly advancing in the field of nature conservation. This is reason enough to take a look at the views of the population on the subject as part of this nature awareness study.

In order to get an introduction to the subject area, two questions were asked. The first concerns the perception of the opportunities and risks of digitisation in general and the perception of the opportunities and risks of digitisation in the field of nature conservation. The second question relates to personal attitudes towards the use of the opportunities that digitisation offers the field of nature conservation.

Table 18: Perception of the opportunities and risks of digitisation in general by gender, age, education and income

There is currently a lot of discussion about digitisation. Some people emphasise the opportunities, others the risks. How do you personally feel about it?

All mentions Data in percent	Aver-age	Gender		Age (years)				Education			Net household income (€)			
	Ø	M	F	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Many opportunities/more of an opportunity	31	33	29	49	38	25	17	24	31	39	14	26	30	43
Many risks/more of a risk	21	20	21	12	16	22	31	23	21	19	19	23	23	17

Heavily over-represented Under-represented Heavily under-represented

7.1 Perception of the opportunities and risks of digitisation

The majority of respondents regard digitisation as an ambivalent development.

A mixed picture emerges when the population is asked about the general opportunities and risks of digitisation: 32 percent of respondents see "many opportunities", 21 percent see "many risks" or view it as "more of a risk", 44 percent see both opportunities and risks, and three percent cannot give an assessment (see Figure 26).

Digitisation is therefore viewed ambivalently by the majority, even though the percentage of those who see it as an opportunity is slightly higher. This rating is roughly the same for both men and women, however, younger people are far more likely to see the opportunities, whereas older respondents see far more risk. In addition, the higher the level of formal education and the higher the income, the greater the perception of the opportunities (see Table 18).

The result of the milieu analysis is as expected. The more digital-savvy milieus are more likely to see the opportunities: the efficiency-oriented High Achiever milieu ("many opportunities/more of an opportunity": 50 percent), the Movers and Shakers who see themselves as the postmodern avant-garde (49 percent) and the Adaptive Pragmatists, who represent the young middle class (48 percent). The less digitally-savvy milieus express far more scepticism. In addition to the New Middle Class milieu ("many opportunities/more of an opportunity": 25 percent), this includes the economically, socially and culturally disadvantaged members of the Precarious milieu (17 percent) and the Traditional milieu – the older generation who love security and order (ten percent).

The Germans see in digitisation more opportunities than risks for nature conservation.

If one asks about the opportunities and risks of digitisation in nature conservation, the assessment shifts slightly towards the positive (see Figure 27): more people see opportunities ("many opportunities/more of an opportunity": 37 percent) than risks ("many risks/more of a risk": 19 percent), but above all far fewer people are ambivalent (36 percent). On the other hand, the "don't know" proportion (eight percent) increas-

Table 19: Perception of the opportunities and risks of digitisation in nature conservation by gender, age, education and income

And if you now think about nature conservation: Do you think that digitisation provides more opportunities or poses more risks?

Data in percent	Aver-age	Gender		Age (years)				Education			Net household income (€)			
	Ø	M	F	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Many opportunities/more of an opportunity	37	40	34	51	42	34	23	27	37	46	27	30	38	45
Many risks/more of a risk	19	19	20	9	16	22	27	21	22	15	12	21	22	15

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

es, possibly because the respondents are not clear on what digitisation and nature conservation might have to do with one another.

The socio-demographic characteristics look similar to the first question: Younger respondents and groups with higher levels of formal education and high incomes see significantly more opportunities than risks. In contrast, the oldest respondents (over 65 years of age) see more risks than opportunities (see Table 19).

In a milieu comparison, it is once again the digital-savvy milieus of the High Achievers, Movers and Shakers, and Adaptive Pragmatists who show an above-average likelihood of associating digitisation in nature conservation with opportunities. In contrast, risks are most often perceived by members of the New Middle Class and Traditional milieus (see Table 20).

7.2 Use of the opportunities that digitisation offers the field of nature conservation

In addition to the analysis of the perceived opportunities and risks of digitisation, the attitudes of the respondents with regard to the use of the possible opportunities that digitisation offers nature conservation were also examined.

More than half of Germans are in favour of greater use of digitisation in nature conservation.

57 percent of respondents "strongly" or at least "somewhat" agreed with the view that nature conservation should try to make better use of the opportunities offered by digitisation. Only ten percent somewhat or expressly disagreed, 26 percent were indifferent and seven percent were unable to make a statement (see Figure 28). The supporters (both levels of approval) were mainly under-50s (up to 29 years of age: 64 percent, 30 to 49 years of age: 63 percent), people with a high level of education (65 percent) and the financially well-off (net household income starting at 3,500 euros: 67 percent).

The milieu analysis is also interesting, as it shows that almost half of all respondents in virtually every social milieu believes that nature conservation should make better use of the opportunities offered by digitisation – only in the Precarious and Traditional milieus the percentages are lower (see Figure 29). Approval is once again most widespread among the young, modern and mostly well-off members of the High Achiever, Movers and Shakers, and Adaptive Pragmatist milieus (each over 70 percent). As a result, one could derive a relatively clear "mandate" for nature conservation to deal more intensely with the topic of digitisation than it has thus far and to take advantage of the associated opportunities.

The majority of Germans would be willing to use a nature conservation app.

44 percent of respondents could imagine using an app that informs them about nature endangerment, the success of nature conservation or possible actions that they could personally take to protect nature (both levels of approval). 32 percent would (rather) not use such an app, 23 percent are not sure, and one percent did not have an opinion on the issue (see Figure 28). Willingness to use an app was significantly higher among the under-50s (up to 29 years of age: 59 percent, 30 to 49 years of age: 52 percent), people with a higher level of education (53 percent), and the financially well-off (net household income starting at 3,500 euros: 57 percent).

The milieu analysis shows: The Movers and Shakers ("very/somewhat willing": 61 percent), Liberal-Intellectual (60 percent) and High Achiever milieus (57 percent) are the most willing to use an app that informs them about nature endangerment, the success of nature conservation or possible actions that they could

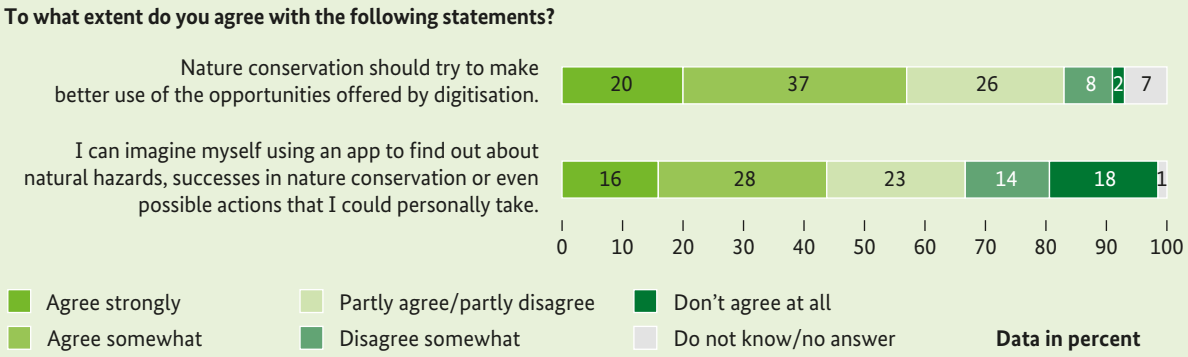
Table 20: Perception of the opportunities and risks of digitisation in nature conservation by social milieu

And if you now think about nature conservation: Do you think that digitisation provides more opportunities or poses more risks?

Data in percent	Average	Established Conservative milieu	Liberal-Intellectual milieu	High Achiever milieu	Movers and Shakers milieu	Adaptive Pragmatist milieu	Socio-Ecological milieu	New Middle Class milieu	Traditional milieu	Precarious milieu	Escapist milieu
Many opportunities/more of an opportunity	37	36	44	58	54	50	36	33	13	30	27
Many risks/more of a risk	19	15	10	12	7	14	21	26	31	24	24

Heavily over-represented Under-represented Heavily under-represented

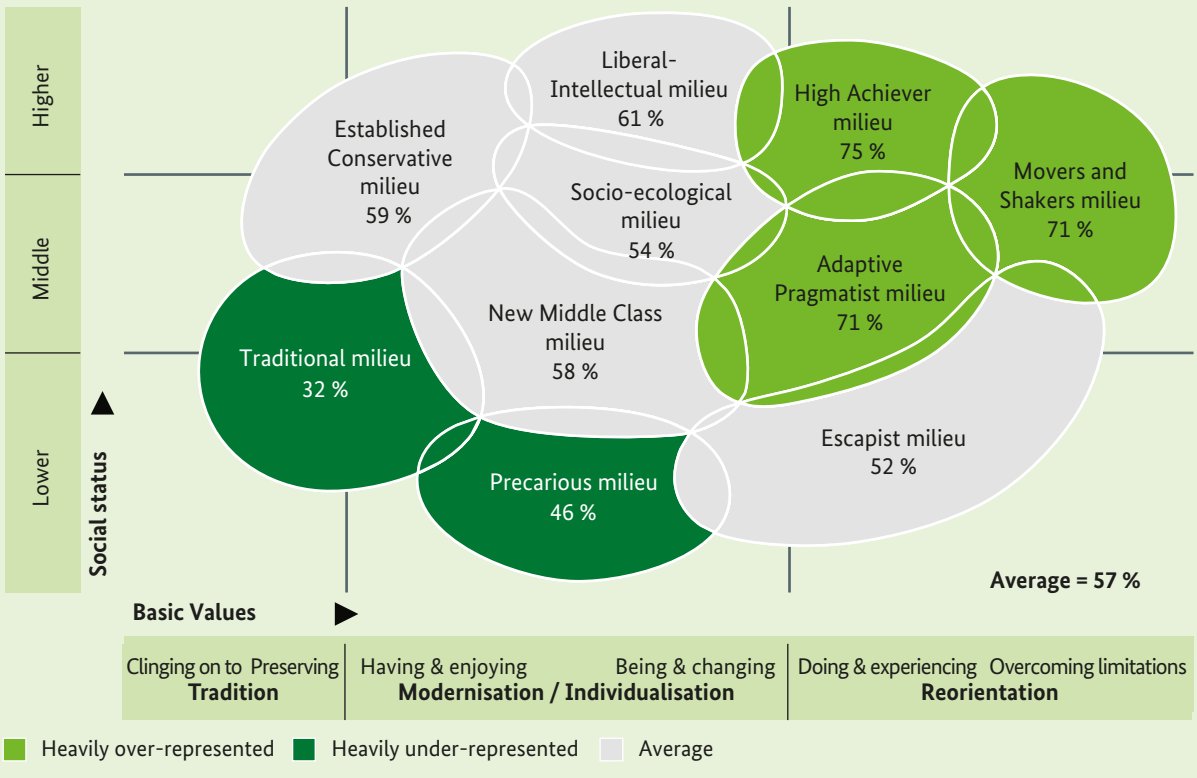
Figure 28: Attitudes towards the use of the opportunities that digitisation offers the field of nature conservation



personally take to protect nature. What these milieus have in common is their high level of skill in using technology and media. In contrast, the Precarious and Traditional milieus often feel overwhelmed by digital propositions. They are sceptical about the increasing digitisation of everyday life. Their willingness to use a nature conservation app is correspondingly low ("very/somewhat willing"; Precarious milieu: 29 percent, Traditional milieu: 13 percent).

Unlike the question of whether nature conservation should make better use of the opportunities offered by digitisation, the question of personal willingness to use a nature conservation app is also about evaluating personal interest and, not least, about individual digital skills. This is where a person's general proximity to or distance from the topic of digitisation has a stronger impact. It must also be remembered that the hypothetical app is just one of the possible applications of digital solutions for use in nature conservation. Many others are conceivable and some of these require far fewer individual digital skills than the use of an app. All in all, the results from this section can be viewed as clear encouragement for greater use of the possibilities and opportunities of digitisation in nature conservation.

Figure 29: Attitudes towards the use of the opportunities that digitisation offers the field of nature conservation by social milieu



8 Biodiversity – spirit of optimism: Attitudes and behavioural willingness have markedly increased

The preservation of biodiversity has been a core concern of nature conservation from the start. Even though early nature conservationists (in the 19th century) knew nothing about DNA[19] or genetic diversity, and the concept of biodiversity had not yet taken shape: They were well aware of the beauty of nature and the breath-taking wealth of various species and habitats. Today, the ecological foundations of nature conservation are further developed and we know that the network of life unfolds at both the level of species and at the level of genes and habitats. However, it is also known that the number of species that have already gone extinct or are endangered has increased sharply. Despite all of the previous attempts of nature conservation, which has since become a global endeavour, it has failed to bring about a fundamental reversal in the trend of the loss of biodiversity at all levels.

It is important to recognise that we are not just protecting "nature" when pursuing nature conservation: We are also protecting our own existence. We are preserving the ability of ecosystems to provide continuous power within the framework of sustainable usage, which is important for a variety of reasons of existential importance. Research confirms with robust evidence that we benefit from so-called "ecosystem services" in many ways, and that our existence is in part directly dependent on them. These include, for example, the provision of drinking water, food and energy sources, the importance of natural spaces for health and recreation, and the safeguarding of our ability to adapt to climate change (see Natural Capital Germany, TEEB DE 2018). Biodiversity is the basis for these ecological services.

The United Nations Convention on Biological Diversity – CBD, which was adopted by Germany at the world summit in Rio de Janeiro in 1992, also serves to preserve biodiversity. Even then it was recognised that biodiversity cannot be protected if there is insufficient public awareness of its value, its endangerment and the need to preserve it (Article 13). In the so-called Aichi biodiversity targets, created as part of the update of the CBD in 2010, it was once again emphasised that raising awareness is key for both combating the causes and implementing the measures.

The National Strategy on Biodiversity, adopted by the German government in 2007, also makes public awareness a high priority and sets itself the task of making the preservation of biodiversity one of the priority social tasks for 75 percent of the population. In addition, the aim is to firmly anchor the importance of biological diversity in social consciousness and to increase people's willingness to take action for the protection of biodiversity (BMU 2007, page 60f).

In order to be able to measure achievement of this target, an indicator was developed – the so-called "awareness of biological diversity" social indicator. Regular recording of this indicator is anchored as a contribution obligation in the National Strategy (Ackermann et al. 2013). The data used for its calculation are collected through nature awareness studies every two years. This chapter presents this indicator for the 2019 survey period, including the findings of the questions underlying the calculation of the indicator.

In order to properly classify the results, it should be mentioned in advance that this indicator, which has been reported on repeatedly, defines relatively high standards for measuring the awareness of biodiversity. It is not enough for people to recognise that the protection of biodiversity is an important political topic – as required by Article 13 of the CBD. People must also show a willingness to do something themselves to preserve biodiversity. This is based on the knowledge that the joint task of "preserving biodiversity" can only be achieved through the active support of the population, even when it comes to their own consumer behaviour.

Against this background, the results of the 2019 Nature Awareness Study are very encouraging, as they show a significant increase in the social indicator overall and above all in its behaviour-related component. This also supports the results of other studies (for example EC 2013, UEB 2019), which have also measured the high and growing importance of biodiversity to the population of Germany.

8.1 Awareness of biodiversity: the overall indicator

The "awareness of biological diversity" social indicator was developed in 2009 (see Kuckartz and Rädiker 2009). It is made up of the sub-areas, "knowledge", "attitude" and "willingness to act". For each of these sub-areas, requirements are set that correspond to the objectives of the National Strategy on the biological diversity. Based on these requirements, a sub-indicator is calculated for all three areas:

- The **indicator "knowledge"** comprises the familiarity and the understanding of the term, "biological diversity.
- The **indicator "attitude"** determines the appreciation of biological diversity.
- The **indicator "willingness to act"** measures the willingness to make one's own contribution to the protection of biodiversity.

The overall indicator is calculated from the three sub-indicators and records the percentage of the population that meet the requirements in all three areas (knowledge, attitude, willingness to act). According to this definition, the level of the overall indicator is the percentage of persons who (1) can name at least one sub-component of biological diversity, (2) express a positive attitude towards biodiversity, and (3) indicate a high willingness to act to contribute to the preservation of biological diversity.

Since according to the selected structure of the overall indicator, it is not sufficient if a person fulfils the defined requirements in only one or two sub-areas (for example, sufficient knowledge and positive attitude, but no sufficient willingness to act), the overall indicator can be no higher than the lowest sub-indicator (see also Figure 30).[20]

The social awareness of the importance of biological diversity has significantly increased, particularly in the "attitude" and "willingness to act" sub-areas.

According to current data, 44 percent of Germans can name at least one of the three aspects of biological diversity (knowledge indicator), 60 percent are sufficiently sensitised to the protection of biological diversity (attitude indicator), and 63 percent express high willingness to contribute to the protection of biodiversity (willingness to act indicator). 28 percent meet the requirements in all three sections (overall indicator). Therefore, according to the definition of the overall indicator, 28 percent of Germans have a high level of awareness of biodiversity. The proportion is far higher in the group of people with a high level of education (39 percent) and in the group with a high net household income (over 3,500 euros: 36 percent). By contrast, those with a low level of formal education (19 percent) and those with a net household income of 1,000 to 1,999 euros (23 percent) are under-represented.

Figure 30: "Awareness of biodiversity" trend indicators and the overall indicator

A comparison of milieus shows that members of the Socio-Ecological milieu most often meet all the requirements of the overall indicator (42 percent). Those in the Liberal-Intellectual milieu and the High Achiever milieu also have a higher than average awareness of the importance of biological diversity. In comparison, the values of the Precarious (19 percent) and Traditional milieus (17 percent) are significantly lower.

A comparison over time reveals that awareness of the importance of biodiversity has increased significantly. Since the beginning of the survey in 2009 through to the values recorded in 2017, the overall indicator has been relatively stable and has fallen between 22 and 25 percent. In the current survey it was over 25 percent for the first time. The overall indicator increased particularly among groups with a high

Table 21: Temporal development of the indicator "awareness of biological diversity"

Data in percent	2009	2011	2013	2015	2017	2019
Sub-indicator "knowledge"	42	41	40	41	42	44
Sub-indicator "attitude"	54	51	54	53	54	60
Sub-indicator "willingness to act"	50	46	50	59	56	63
Overall indicator	22	23	25	24	25	28

level of education (2017: 32 percent, 2019: 39 percent) and a high net household income (2017: 30, 2019: 36 percent). The highest values over time were measured in 2019 in all three sub-areas. Compared to 2017, the "willingness to act" sub-indicator in particular has clearly increased: the willingness to make one's own contribution towards preserving biodiversity has increased by seven percentage points (see Table 21). By far the greatest improvement can be seen in the group of under-30s (2017: 48 percent, 2019: 65 percent) (see also Table 22). The willingness of the younger generation to be actively engaged in environmental and nature conservation issues has gained considerable momentum. It can be assumed that the proliferation of youth movements such as "Fridays for Future", "Ende Gelände" or "Extinction Rebellion" have played a role in this. In addition to the behavioural willingness indicator, the attitude indicator has also noticeably improved (2017: 54 percent, 2019: 60 percent). The largest increase here has also been in the younger generation (2017: 43 percent, 2019: 56 percent). The "knowledge" sub-indicator, on the other hand, has not undergone significant change.

A comparison over time by milieu reveals that awareness of the importance of biodiversity has improved in large parts of the middle class. For example, the overall indicator in the Adaptive Pragmatist and New Middle Class milieus rose by four percentage points each, while in the Socio-Ecological milieu it increased by eight percent. In addition, increased awareness can also be seen in the higher class and globally-oriented High Achiever milieu (2017: 32 percent, 2019: 38 percent). In contrast, no significant changes could be seen in the traditional value segment (Traditional milieu and Established Conservative milieu) (see Figure 31).

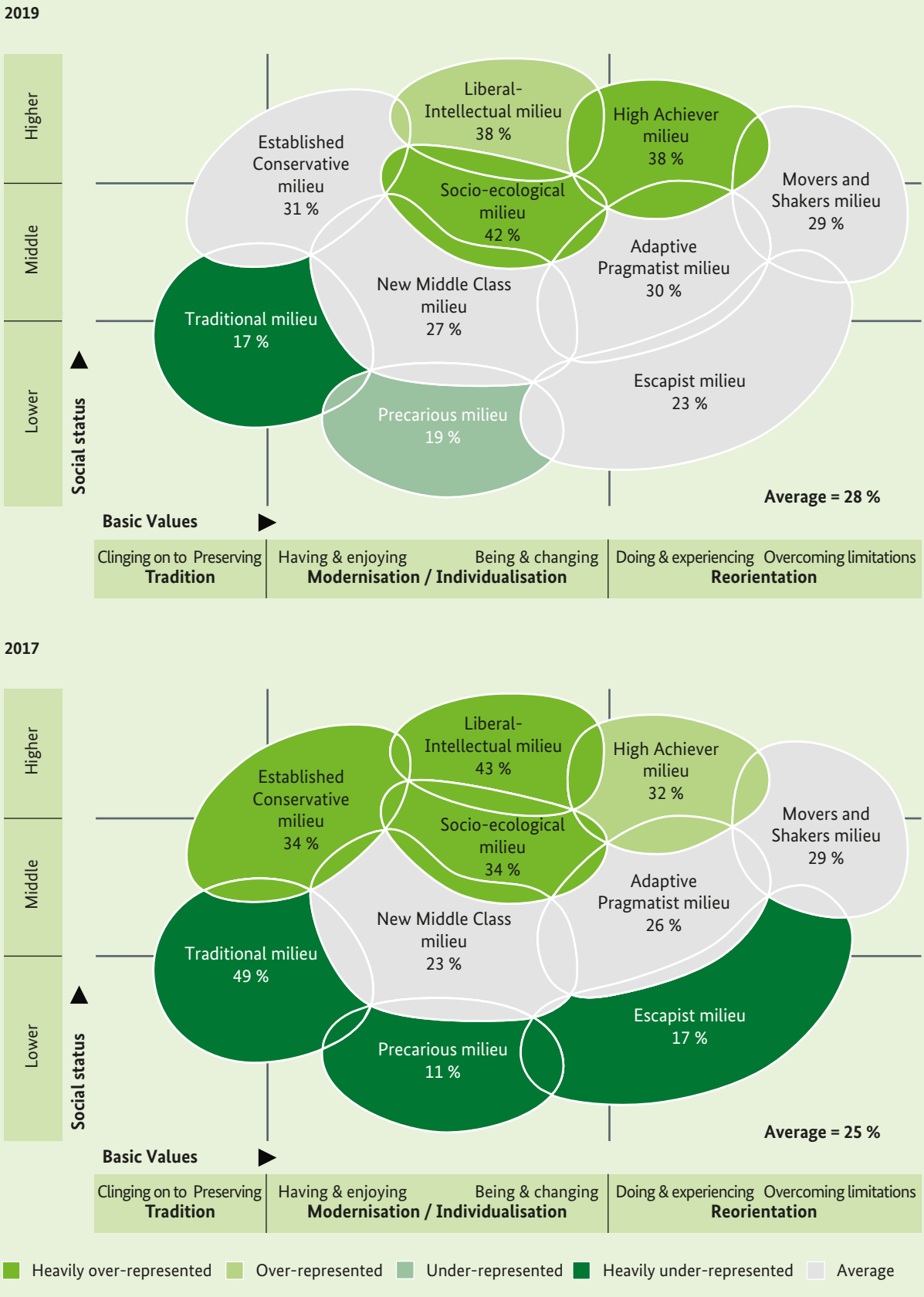
The survey results used to calculate the sub-indicators are presented in the following sections, for a more detailed examination of the findings.

Table 22: Temporal development of the indicators by gender, age and level of education

Data in percent		Average	Gender		Age (years)				Education		
		Ø	M	F	up to 29	30 to 49	50 to 65	over 65	low	mid	high
Sub-indicator "knowledge"	2017	42	44	40	38	46	42	38	33	41	55
	2019	44	48	40	39	44	50	41	34	43	56
Sub-indicator "attitude"	2017	54	51	57	43	56	59	53	51	55	59
	2019	60	58	62	56	61	63	57	51	61	67
Sub-indicator "willingness to act"	2017	56	52	59	48	59	56	56	50	55	64
	2019	63	60	66	65	64	63	60	55	65	71
Overall indicator	2017	25	24	26	21	28	27	22	21	24	32
	2019	28	30	27	25	30	32	24	19	28	39

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

Figure 31: Overall indicator by Sinus milieu, comparison of 2017 and 2019 values



8.2 Familiarity and understanding: the knowledge indicator

The majority of Germans still do not know what the term "biological diversity" means.

16 percent of Germans have never heard of the term biodiversity. 39 percent say that they have heard the term before but do not know what biological diversity means. This leaves 45 percent who not only know the term "biodiversity", but also know what it means (see Figure 32).

It is above all those who are well-educated and well-paid who know the meaning of biodiversity (well-educated: 56 percent, net household income starting at 3,500 euros: 54 percent). In contrast, the term is less well-known among those with a low level of formal education (35 percent) and those with a net household income of 1,000 to 1,999 euros (37 percent). Furthermore, men are more likely to state that they know what the term "biodiversity" means than women (men: 48 percent, women: 41 percent). In addition, it is noticeable that knowledge about the meaning of the term increases with age – but only up to the 50 to 65 age group (50 percent). Only 41 percent of people know what the term means in the group of over-65s.

The comparison of lifeworlds shows that the significance of biodiversity in terms of content is best known among the higher social milieus. This is especially true for the Liberal-Intellectual (59 percent), the High Achiever milieu (55 percent), and the Socio-Ecological milieu (56 percent). In the Escapist (38 percent), Precarious (35 percent) and Traditional (34 percent) milieus, however, there are far fewer people who are aware of the meaning of the term (see Figure 33).

In a comparison over time, it is noticeable that the proportion of those who do not associate anything with the term "biodiversity" has declined. At 16 percent it is well below one-fifth for the first time ever (see Figure 32). The proportion of those who do not know the meaning but who have heard the term has increased only marginally compared to 2017, but has reached its highest value to date (39 percent). The number of people able to state what the term entails has also reached the highest value to date. This has increased by three percentage points since 2017 (45 percent).

Biodiversity is most often equated with the diversity of species.

93 percent of respondents who knew the meaning of the term "biodiversity" associate it with the diversity of plant and animal species (see Figure 34). Around two-thirds (also) think of the diversity of ecosystems and habitats. Most often it is people with a high income who name the biodiversity ecosystem sub-components (net household income starting at 3,500 euros: 71 percent). The fact that biodiversity also includes the diversity of genes, genetic information and genetic material is significantly less well known to respon-

Figure 32: Familiarity with the term "biological diversity" compared over time

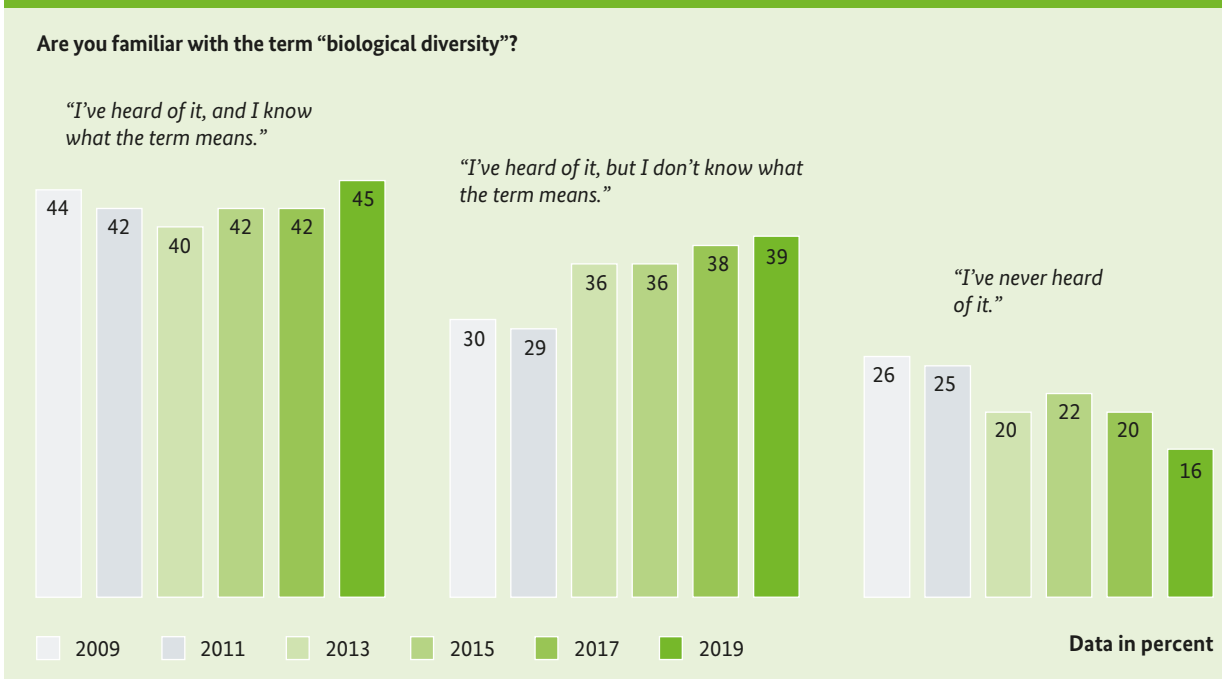
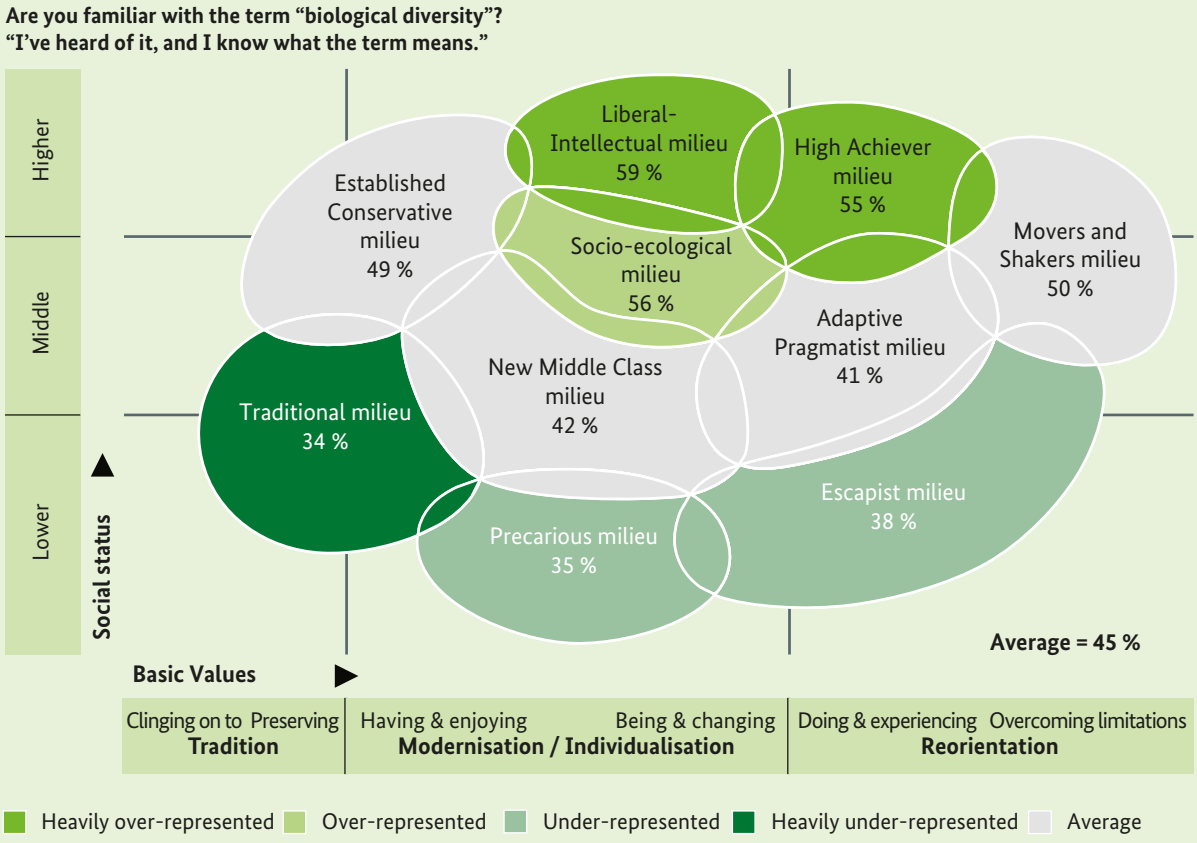


Figure 33: Familiarity with the term "biological diversity" by Sinus milieu



dents (42 percent). It is primarily the well-educated (51 percent) and respondents with the highest income level (54 percent), who have more knowledge about this.

In a milieu comparison, the number of those who (also) consider the diversity of genes when thinking about biodiversity is greatest in the Movers and Shakers milieu (54 percent) and lowest in the Precarious milieu (23 percent).

When compared to 2017, knowledge about the three partial aspects of biodiversity remained about the same within the group of those familiar with the term: The percentage of respondents who associate

Figure 34: Understanding of the term "biological diversity"

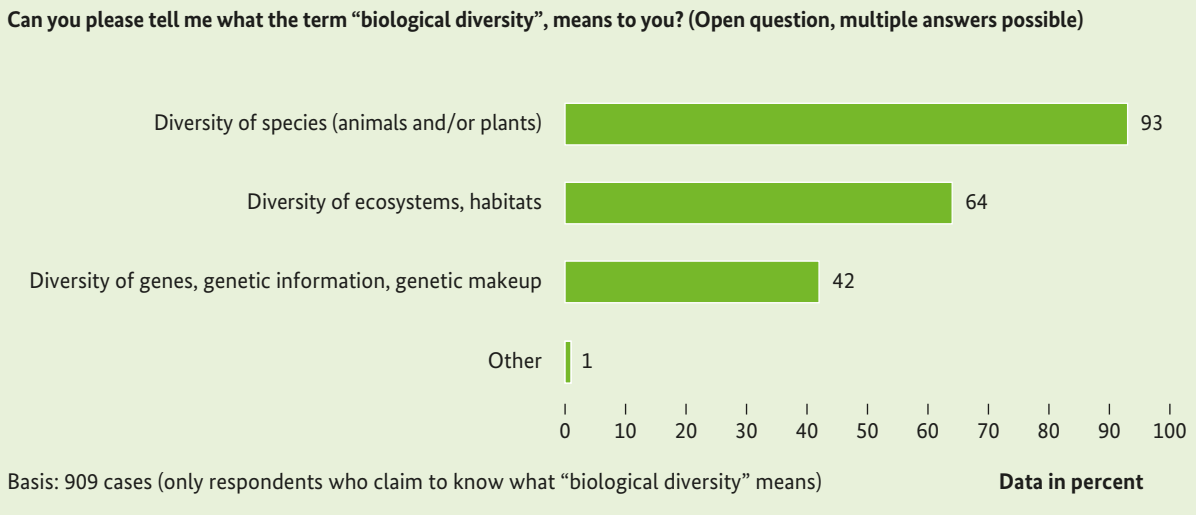
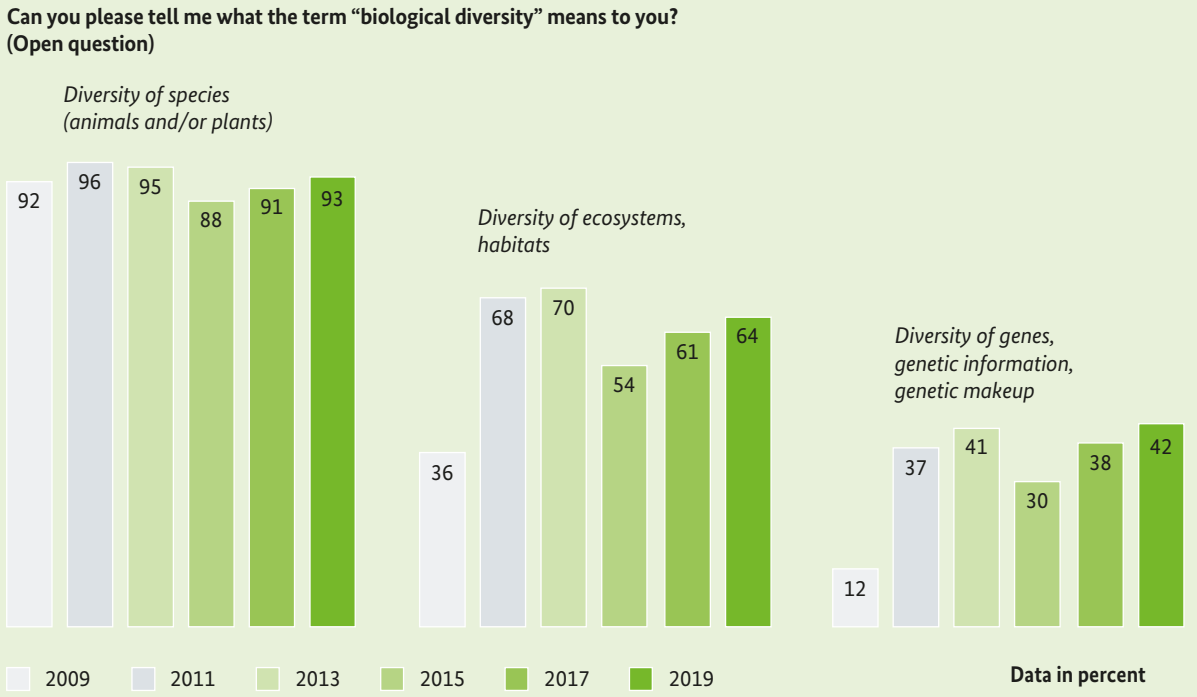


Figure 35: Understanding of the term "biological diversity" compared over time



biodiversity with species diversity has increased by two percentage points. The percentage of those who (also) understand biodiversity as the diversity of ecosystems has risen by three percentage points. In 2017, 38 percent knew that biodiversity also includes the diversity of genes, genetic information and genetic material, and in 2019 this is known by 42 percent (see Figure 35).

8.3 Appreciation of biodiversity: the attitude indicator

Following the questions in the "knowledge" section, all respondents were presented with a definition of biological diversity in order to bring them to a comparable level of knowledge with regard to the meaning of the term.[21] This was followed by questions relating to attitude and willingness to take action.

Large parts of the population are convinced of the decline in biodiversity.

Four out of five respondents believe that biodiversity on earth is diminishing, 16 percent are undecided, while only a fraction of two percent are not convinced (see Figure 36). It is noticeable that the percentage of those who are firmly convinced of the decline in biodiversity has increased by six percentage points as compared to 2017 – even though this proportion already increased by ten percentage points in the previous study ("very convinced": 2015: 26 percent, 2017: 36 percent, 2019: 42 percent). People with a high level of education ("very convinced": 47 percent), those aged 50 to 65 (48 percent) and those with a high net household income (starting at 3,500 euros: 49 percent) are particularly aware of the threat to biodiversity.

The education-oriented and environmentally-aware Socio-Ecological ("very convinced": 59 percent, "very/somewhat convinced": 94 percent) and Liberal-intellectual milieus ("very convinced": 55 percent, "very/somewhat convinced": 91 percent) are particularly aware of the problem of declining biodiversity. Awareness of the decline of biodiversity is the least pronounced and least widespread in the less information-oriented and nature-loving Escapist milieu ("very convinced": 27 percent, "very/somewhat convinced": 72 percent).

More than three-quarters of Germans consider the protection of biodiversity to be a top social priority.

When asked whether conservation of biodiversity is a top social priority, 43 percent unconditionally respond with "yes", while another 34 percent with "somewhat of a priority" (see Figure 37). This means that general agreement with this question has increased by six percentage points since 2017 (2017: "yes"/"somewhat of a priority": 71 percent). It is noteworthy that unreserved approval rose by twelve percentage points (2017: "yes": 31 percent). Unreserved approval is highest in the groups with a high level of formal education (48 percent), while it is below-average in the 30 to 49 age group and in groups with a net household income of 1,000 to 1,999 euros (38 percent each).

In a milieu comparison, it is the Socio-Ecological milieu who most commonly consider the preservation of biodiversity to be a top social priority ("yes"/"somewhat of a priority": 87 percent). More than one in two people in this milieu unreservedly consider the preservation of biodiversity to be a central social concern ("yes": 57 percent). Awareness of the problem is, however, below-average in the Escapist milieu. Although there are still 68 percent who class the preservation of biodiversity a top social priority, those giving full approval comprise only 32 percent.

Nine out of ten Germans see climate change as a threat to biodiversity.

90 percent of respondents perceive climate change as a threat to biodiversity (see Figure 38).[22] This view is the most widespread in the group of the financially well-off (net household income starting at 3,500 euros)

Figure 36: Perceived decline of biodiversity

How convinced are you that biodiversity on earth is in decline? Are you...

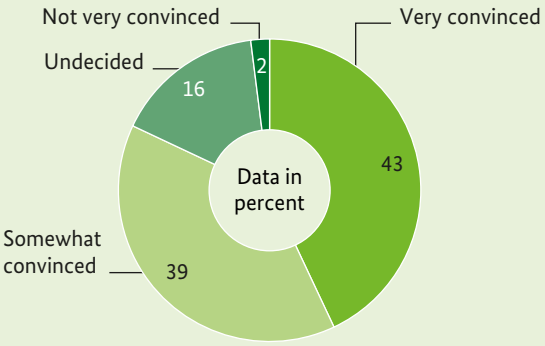
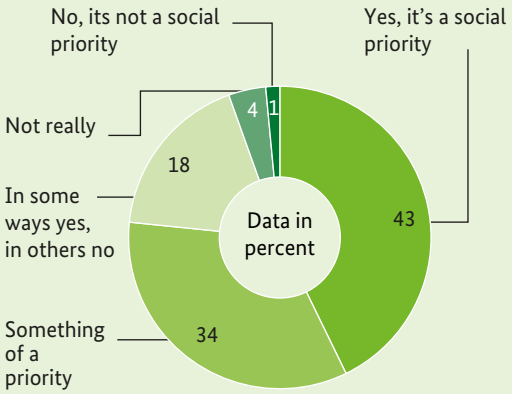


Figure 37: Perceived social importance of conserving biodiversity

The Federal Republic of Germany has committed itself in international agreements to the preservation of biodiversity. To what extent do you personally consider the preservation of biodiversity to be a social priority? Would you say, ...

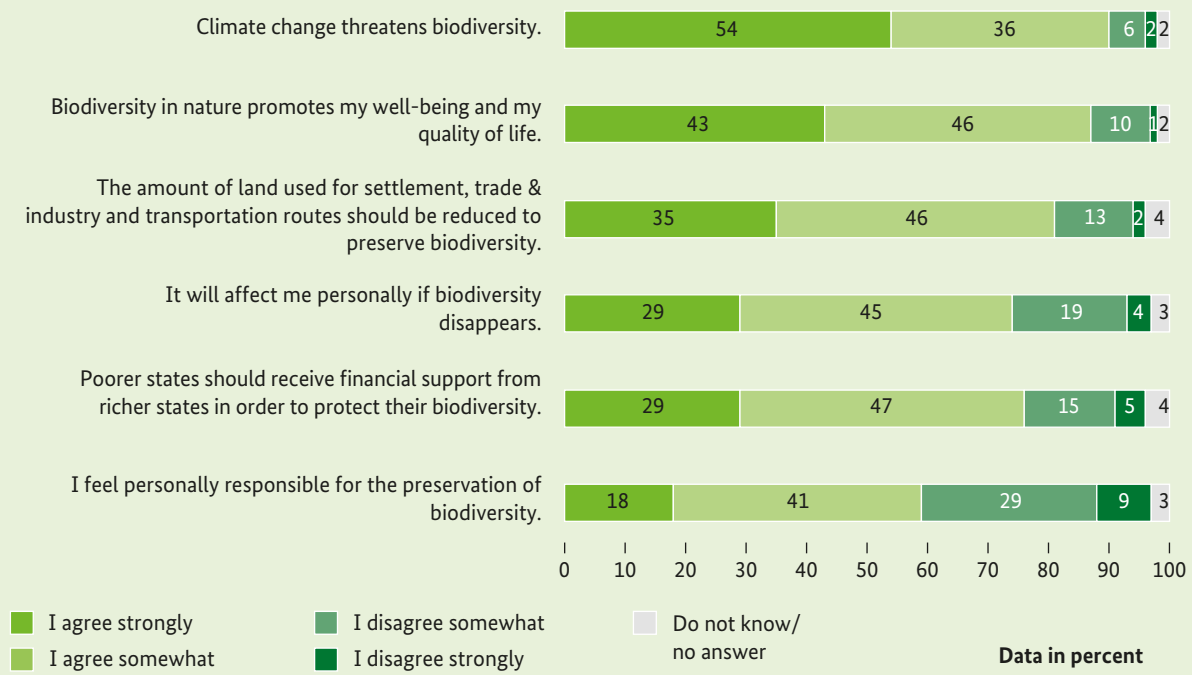


(both levels of approval: 93 percent). The majority of Germans fear that the decline in biodiversity will have negative consequences for their own lives: While 87 percent believe that biodiversity in nature is beneficial to their wellbeing and quality of life, 74 percent say it would be harmful to them personally if biodiversity dwindles (see Figure 38). The financially well-off (net household income starting at 3,500 euros: 79 percent) and people with a high level of education (80 percent) associate the decline of biodiversity with negative consequences for their own life. Compared to 2017, this fear has spread a little more (2017: 70 percent).

Demands for political measures to protect biodiversity are met with approval from more than three-quarters of respondents: 81 percent are in favour of reducing the reclassification of empty sites for the construction of housing developments, commercial infrastructure and transport routes, while 76 percent are in favour of poorer states receiving financial support from richer states to protect their native biodiversity. The latter option is particularly favoured by those with a high level of education (both levels of approval: 80 percent). Below-average approval can be seen in groups with a low level of formal education (71 percent) and those with a net household income of 1,000 to 1,999 euros (70 percent).

Figure 38: Personal significance of biodiversity

Please tell me in each case to what extent you agree with the statement.

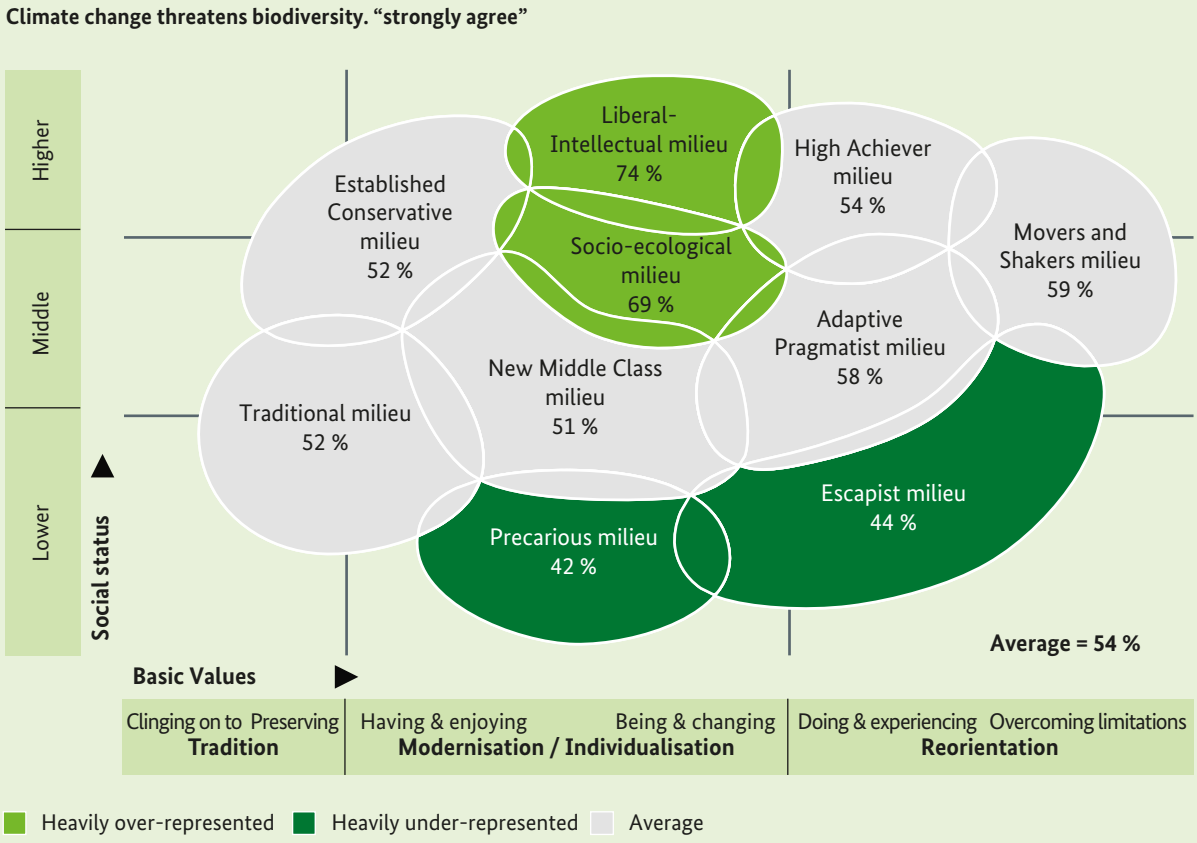


Compared to the previous study, the proportion of those who unreservedly agree with the reduction of the use of areas for housing developments, commercial infrastructure and transport routes has significantly increased: In 2017, 25 percent stated that they were "strongly" in favour, and 52 percent "somewhat" in favour, while in the current survey, it is 35 percent who completely agree and 46 percent who somewhat agree. Support for poorer states has not changed significantly (highest level of approval: 2017: 30 percent, 2019: 29 percent, both levels of approval: 2017: 78 percent, 2019: 76 percent).

While most respondents consider the preservation of biodiversity to be an important task for society as a whole, willingness to take personal responsibility is much lower: 59 percent say that they feel personally responsible for the preservation of biodiversity, and 38 percent do not see themselves as having an obligation. It is most often those with a high level of formal education and the financially well-off who see themselves as responsible (both levels of approval: 66 percent each). It is positive to note that perceived obligation to take responsibility has increased compared to 2017. Whereas in 2017, just 13 percent voiced an unreserved sense their responsibility and a further 40 percent thought that they had some obligation, the values for 2019 are 18 percent (unreserved approval) and 41 percent (limited approval).

Observation of the milieu findings shows that the values for the sensitisation and appreciation of biodiversity are highest among the problem-conscious and nature-loving Liberal-Intellectual and Socio-Ecological milieus. 74 percent of the Liberal-Intellectuals and 69 percent of the Socio-Ecological milieus are unreservedly convinced that climate change poses a threat to biodiversity (see Figure 39). At the same time, around 40 percent of the members of these milieus emphasise that they would be personally affected if biodiversity fades (highest level of approval: Liberal-Intellectual: 40 percent, Socio-Ecological: 41 percent, average: 29 percent). In contrast, the approval ratings were significantly lower in the less education and nature-interested Escapist and Precarious milieus: 44 percent of the Escapist milieu and 42 percent of the Precarious milieu are fully convinced of the threat that climate change poses to biodiversity. Only 22 percent of the Escapist milieu and 15 percent of the Precarious milieu agree with the statement that they would be affected if biodiversity dwindles.

Figure 39: Perception of the threat to biodiversity posed by climate change, by social milieu



8.4 Willingness to act: the behaviour indicator

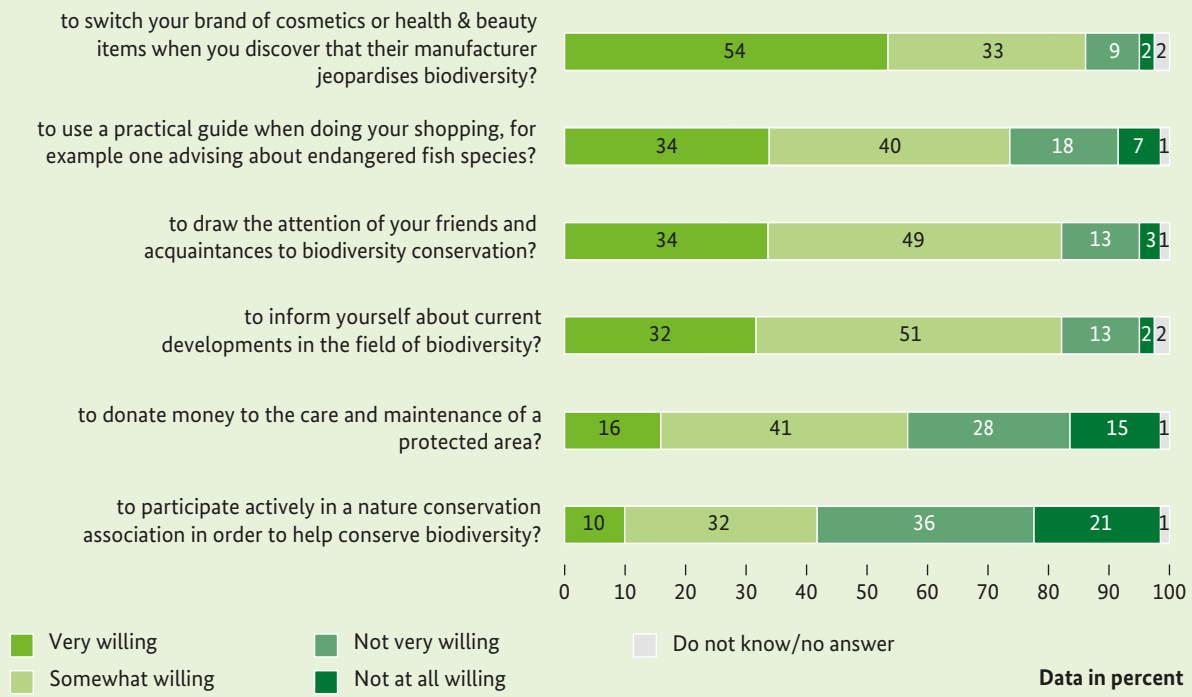
The willingness to contribute actively to the preservation of biological diversity has increased.

The general willingness to make one's own contribution to the preservation of biodiversity is widespread among the population (see Figure 40): 87 percent are "very" or "somewhat willing" to switch to eco-friendly cosmetics and drugstore items. 83 percent of respondents are willing to inform friends and acquaintances about the protection of biodiversity and to inquire about current developments in the area of biological diversity. Around three-quarters also stated they would be willing to use a guidebook that provides information about endangered species of fish when shopping, for example. Furthermore, 57 percent could imagine donating to the care and preservation of a protected area. General willingness to actively participate in a nature conservation association is 42 percent.

It should be emphasised that the unreserved willingness to contribute actively to maintaining biodiversity has increased noticeably in four of the six behaviour options compared to results from 2017. Only the willingness to donate and the willingness to participate actively in a nature conservation association have remained more or less the same (see Table 23).

The socio-demographic analysis reveals that the willingness to act increases with the level of education (see Table 24). It is also striking that most of the behaviours queried are more popular among those with a net household income starting at 3,500 euros than among those who are less financially well-off. In addition, we can also see that the willingness to donate is below-average in the over-65s and that willingness to participate actively in a nature conservation association decreases with age. Compared to 2017, by far the greatest differences can be seen in the group of the under-30s. For example, in 2017, 21 percent of under-30s were "very willing" to make friends and acquaintances aware of the protection of biodiversity. In the current survey it is 39 percent – a difference of 18 percentage points.

Figure 40: Willingness to play an active part in conserving biodiversity



A willingness to donate is most pronounced in the High Achiever milieu.

When looking at the social milieus, it is noticeable that the willingness to protect biodiversity is lowest in the milieus on the lower social fringe – Precarious, Escapist and Traditional. For example, no more than a quarter of members of these milieus completely agree that they are willing to inform friends and acquaintances of the protection of biodiversity (Escapist milieu: 26 percent, Traditional milieu: 25 percent, Precarious milieu: 21 percent). At least one third of those surveyed expressed an unreserved willingness to do so. It is also noticeable that the willingness to move to

Table 23: Temporal development of the willingness to play an active part in conserving biodiversity

I am now going to read you some options on what you can do personally to protect biological diversity.
How willing are you personally...

Response category: Very willing Data in percent	2009	2011	2013	2015	2017	2019
to switch your brand of cosmetics or health & beauty items when you discover that their manufacturing jeopardises biodiversity?	42	37	34	40	46	54
to keep informed about current developments in the field of biodiversity?	18	23	25	26	24	32
to use a practical guide when doing your shopping, for example, one advising about endangered fish species?	19	24	22	27	26	34
to draw the attention of your friends and acquaintances to biodiversity conservation?	24	23	21	32	27	34
to donate money to the care and maintenance of a protected area?	13	10	11	14	14	16
to participate actively in a nature conservation association in order to help conserve biodiversity?	11	8	9	13	8	10

Table 24: Willingness to play an active part in conserving biodiversity by age, education and income

I am now going to read you some options on what you can do personally to protect biological diversity. How willing are you personally...

Response category: Very willing Data in percent	Average	Age (years)				Education			Net household income (€)			
	Ø	up to 29	30 to 49	50 to 65	over 65	low	mid	high	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
to switch your brand of cosmetics or health & beauty items when you discover that their manufacturing jeopardises biodiversity?	54	55	53	56	54	51	52	60	44	53	52	60
to use a practical guide when doing your shopping, for example, one advising about endangered fish species?	34	33	36	35	30	28	34	39	21	31	35	35
to draw the attention of your friends and acquaintances to biodiversity conservation?	34	39	33	33	31	28	33	40	24	34	33	37
to keep informed about current developments in the field of biodiversity?	32	31	31	35	30	26	29	41	27	32	29	38
to donate money to the care and maintenance of a protected area?	16	13	18	18	12	12	16	19	6	13	15	21
to participate actively in a nature conservation association in order to help conserve biodiversity?	10	14	10	10	6	6	8	15	8	9	10	13

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

eco-friendly cosmetics is not only above-average in the ecologically pioneering Socio-Ecological milieu (very wiling: 67 percent), but also in the modern, young middle-class (Adaptive-Pragmatist milieu: 64 percent) and in the classic establishment (Established Conservative milieu: 63 percent). In contrast, willingness to donate is the highest among the economically-oriented High Achiever milieu (very willing: 24 percent, average: 16 percent).

Compared to 2017, the willingness to take action has increased the most in the middle-class milieus. For example, in 2017, 19 percent of the New Middle Class, 23 percent of the Adaptive Pragmatist and 29 percent of the Socio-Ecological milieus expressed a very high willingness to find out about current developments in the area of biodiversity. In the current survey this increased to 29 percent of the New Middle Class, 34 percent of the Adaptive Pragmatist and 42 percent of the Socio-Ecological milieus.

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Abbreviations

BfN	Federal Agency for Nature Conservation
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BVDW	German Digital Media Association
CAPI	Computer-Assisted Face-to-Face Interviews
Cas	CRISPR-associated protein
CBD	Convention on Biological Diversity
CRISPR	Clustered Regularly Interspaced Short Palindromic Repeats
DNA	Deoxyribonucleic acid
e.g.	exempli gratia
et al	et alii/et aliae/et alia
etc.	et cetera
EU	European Union
FFH	Fauna-Flora-Habitat Directive
GESIS	German Social Science Infrastructure Services Association
GmbH	Limited liability company
IT	Information technology
NBS	National Strategy on Biological Diversity
PC	Personal computer
PIK	Potsdam Institute for Climate Impact Research
QR	Quick response
SPSS	Statistical and analytic software from IBM (Statistical Package for the Social Sciences)
TV	Television
UBA	Federal Environment Agency
WBGU	German Advisory Council on Global Change

Basic count

Chapter 2: Protected areas

A2.1 In the following, we would like to hear your opinion about protected areas for nature in Germany. 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 2)

Data in percent		Data in percent	
Protected area categories	60	Seas	9
Landscape/nature	43	Prohibitions/regulations	5
Protection purpose	41	Nature/environmental catastrophes and destruction	3
Animals/plants/living beings	21	Other associations	18
Recreation/leisure activities	9		

Protected area categories – subcategories (60 %)

Data in percent		Data in percent	
Nature reserves	25	Reserves	4
Water protection area	19	Botanical reserves	3
Bird sanctuaries	18	Forest reserves	2
National parks	12	(World)cultural heritage/natural heritage sites	2
Nature parks	11	Marine reserves/fishery protection zones	1
Landscape reserves	11	Flood plain areas	1
Marine conservation area	9	Ground/drinking water protection areas	1
Specific protected areas	8	Wildlife sanctuaries	1
Eifel	1	Monuments/natural monuments	1
Bavarian forest	1	Bundeswehr/military land/border areas	1
Other specific protected areas	6	Natura 2000	1
Protected areas	5	Other comments	2
Wildlife reserves	5		

Landscape/nature – subcategories (43 %)

Data in percent		Data in percent	
Landscape in general	3	Wild/wilderness	2
Habitat/biosphere/biotope	9	Jungle/pristine forest/rainforest	2
Woods/forest	8	Undeveloped areas/landscapes (no streets, houses, etc.)	2
Nature/environment	5	Parks/green spaces/gardens	2
Fenced off/blocked off/cordoned off (spaces/areas)	5	Bird park	1
Lakes	4	Mountains/Alps	1
Untouched nature	4	Beautiful, clean, healthy landscape/nature/environment	1
Marshes/moors	3	Bird nesting sites/bird nests/breeding grounds	1
Natural	3	Original	1
Water/bodies of water	2	Heath/heathland	1
River/rivers	2	Other	5
Meadows/flowering meadows	2		

Protection purpose – subcategories (41 %)

Data in percent		Data in percent	
Environment/nature conservation	16	Protection of the forests	3
Animal conservation	15	Marine conservation	3
Plant conservation	8	No hunting allowed	1
Species conservation	7	Climate protection	1
Water/body of water protection	6	Protection of habitats	1
Landscape conservation	5	Insect conservation (bees, etc.)	1
In need of protection/must be protected	4	Basis for human life	1
Bird conservation	4	Other	4

Animals/plants/living beings – subcategories (21 %)

Data in percent		Data in percent	
Animals in general	11	Wild animals (wolves, deer, hares, tigers, elephants...)/wild animals/predators	1
Plants in general	7	Flowers in general	1
Birds	4	Animal diversity/different animals	1
Rare/endangered animals	3	Fish	1
Trees	2	Butterflies	1
Insects	2	Other animals	2
Rare/endangered plants	2	Other plants	2

Recreation/leisure activities – subcategories (9 %)

Data in percent		Data in percent	
Zoo/animal park/wildlife park	3	Quiet/calm/still	2
Good/fresh/clean/healthy air	2	Hiking/going for a walk	1
Relax/unwind/recharge	2	Other comments	2

Seas – subcategories (9 %)

Data in percent		Data in percent	
Wadden Sea	4	Beach/dunes	1
Sea/ocean	3	Other comments	1

Prohibitions/regulations – subcategories (5 %)

Data in percent	
Regulations/prohibitions/rules/specified routes (for visitors)/no access/no entry	5

Nature/environmental catastrophes & destruction – subcategories (3 %)

Data in percent		Data in percent	
Climate change	1	Other comments	3

Other associations – subcategories (18 %)

Data in percent		Data in percent	
Species diversity/diversity/very diverse	3	No traffic/no cars	1
No people/isolated	2	Agriculture	1
Is an important topic	1	Human beings	1
Specific organisations (e.g. NABU, WWF, etc.)	1	There are too few protected areas/there should be more	1
Living beings/life	1	Other associations	7
Green/lots of greenery	1	Unknown/nothing	0
Everything that has not been created/influenced by human beings	1	Do not know	0

A2.2 Protected areas are designated areas with the aim of preserving and developing nature and the landscape. I will now list various terms. Please tell me whether you have heard these terms before. (Figure 3)

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	Do not know/no answer
Nature reserve	89	10	1	0
Bird sanctuary	87	11	1	1
Water protection area	82	15	3	0
National park	76	22	2	0
Landscape reserve	73	22	5	0
Marine conservation area	73	21	6	0
Nature park	63	27	10	0
National natural heritage site	33	36	31	0
National natural landscape	32	34	33	1
Biosphere reserve/area	30	29	41	0
Natura 2000	7	16	77	0
FFH area	5	12	83	0

A2.3 How often do you purposefully visit the following protected areas? (Filter: anyone who answers the terminology question and responds "I've heard of it, and I know what the term means." to the terms "Natura 2000", "National park", "Nature reserve", "Biosphere reserve" and "Nature park" (Figure 4)

Data in percent	Daily/every week	Monthly	At least once a year	Less than once a year	Do not know/ no answer
Nature reserve	3	9	28	55	5
Nature park	3	6	26	62	3
Biosphere reserve/area	1	3	20	72	4
National park	1	3	21	69	6
Natura 2000	3	2	13	76	6

A2.4 Where do you visit protected areas? (Multiple answers possible) (Figure 5)

Data in percent	
As part of an excursion in the region	52
In the immediate vicinity of my place of residence	46
On holiday in Germany	44
On holiday abroad	22
Do not know/no answer	6

A2.5 Please select three keywords from the following which, in your opinion, should be the most important objectives and tasks of protected areas. (Figure 6)

Data in percent	
Ensuring the biodiversity of animals and plants	68
Allowing undisturbed landscape development	38
Preserving beautiful landscapes	36
Safeguarding the basis for human existence (e.g. clean air and water)	29
Allowing wilderness	24
Combating climate change	21
Ensuring the protective function of the landscape (e.g. to protect against erosion, flooding)	21
Preserving homeland	17
Promoting ecological agriculture	10
Enabling recreation (e.g. sport, leisure)	10
Promoting environmentally friendly tourism	9
Promoting adaptation to climate change	9
Supporting education and science	5

A2.6 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 8)

Data in percent	
Protected animal and plant species	72
Protected habitats	46
Condition of the protected area (positive/negative developments)	31
Experience and recreational opportunities	28
Type of protection and development measures being implemented	26
Proximity and accessibility of protected areas near to place of residence	26
Prohibitions and regulations in the protected area	22
Connection between the protected area and its habitats and landscape history	20
Refreshment options and trails	19
Opportunities to get involved personally in the protected area	6

A2.7 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 9)

Data in percent	
Local guided tours	62
Information available locally (e.g. information centre, information boards)	61
Television	55
Internet (e.g. websites, video platforms)	46
General educational institutions (e.g. schools, adult education centres)	28
Digital media (e.g. apps, QR codes)	28

A2.8 Who, in your opinion, should bear more responsibility for ensuring that protected areas can fulfil their tasks in the future? (Figure 10)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Do not know/no answer
Environmental and nature conservation organisations	67	21	9	2	0	1
Forestry sector	58	27	11	3	1	0
Federal states	57	31	10	2	0	0
German government	57	27	11	3	1	1
Municipalities	49	31	17	2	1	0
Agriculture	48	30	16	4	1	1
Citizens	44	33	17	4	1	1
Industry, trade, other economic bodies	41	26	20	8	5	0
Tourism sector	38	28	23	8	3	0
Churches and religious communities	14	14	24	25	22	1

A2.9 How do you rate the following statements? (Figure 7)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Do not know/no answer
I think that protected areas are important for preserving nature for future generations.	72	21	6	1	0	0
I think it is good that there are areas where nature conservation is particularly important.	67	25	7	1	0	0
I think that protected areas will be of greater importance for the conservation of species in the future than they have been thus far.	58	29	9	2	0	2
Protected areas are an important part of my homeland.	45	32	17	5	1	0
Protected areas make a significant contribution to the identity of a region.	44	35	16	4	1	0
Germany should be more politically committed to maintaining and expanding international protected area networks.	38	34	19	5	1	3
Protected areas make a significant economic contribution to a region.	34	30	24	9	2	1
Protected areas leave too many people out due to too many prohibitions.	7	19	29	27	15	3
I think there are enough protected areas in Germany.	6	9	18	32	29	6

Chapter 3: Species knowledge

A3.1 To what extent do you agree with the following statements? Do you... (Figure 11)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all
I would like to know more animal and plant species by name.	18	35	32	11	4
I know a lot about the local wildlife.	11	30	42	14	3
I am very familiar with the local plant life.	9	25	39	21	6

A3.2 Please select three species groups that you would like to know more about from the following list. (Figure 12)

Data in percent	
Birds	49
Flowering plants	41
Trees	39
Insects (beetles, bees, butterflies, etc.)	37
Mammals	30
Fungi	29
Reptiles and amphibians	18
Fish	18
Ferns and mosses	13
Spiders	6
Mussels and snails	5

A3.3 Please select three options from the following list which, in your opinion, you feel should communicate more knowledge about species diversity. (Figure 13)

Data in percent	
Guided nature tours	44
Schools	40
Television	31
Information available locally (e.g. information centre, information boards)	29
Zoos and animal parks	28
Nature conservation associations	24
Internet (e.g. websites, video platforms)	21
Botanical gardens	21
Parents, family	17
Digital media (apps, QR codes)	14
General educational institutions, such as adult education centres	11
Universities	6
Open-air museums	5
Occupational environment	3

Chapter 4: The connection between humans and nature

A4.1 I would like to know what spontaneously comes to mind regarding the topic of nature. Please list as many terms as you can think of. (Open question, multiple answers possible) (Figure 14)

Data in percent		Data in percent	
Landscape/nature & landscape objects	60	Seas	13
Animals/living beings	52	Exploitation	11
Plant life	44	Climate	10
Recreation, leisure & experiencing nature	38	Nature/environmental catastrophes and destruction	8
Bodies of water/lakes	31	Sky phenomena	6
Environmental/nature/animal conservation	14	Other associations	35

Landscape/nature & landscape objects – subcategories (60 %)

Data in percent		Data in percent	
Landscape in general	5	Stones/minerals	2
Woods/forest	26	Soil/ground/sand	1
Meadows/flowering meadows	16	Marshes/moors	1
Mountains/Alps	10	Healthy forests	1
Beautiful, clean, healthy landscape/nature/environment	5	Originality	1
Untouched nature	5	Deserts	1
Parks/green spaces/gardens	3	Jungle/rainforest/pristine forest/tropics	1
Outside/everything that surrounds us/my environment	3	National parks/nature parks	1
Undeveloped areas/landscapes/no industry	3	Heath/heathland	1
Habitat/biosphere/biotope	3	Antarctica/glaciers/ice/polar region	1
Wild/wilderness	2	Cliffs/crags	1
Nature/environment	2	Valleys	1
Natural	2	Other	3

Animals/living beings – subcategories (52 %)

Data in percent		Data in percent	
Animals in general	35	Butterflies	1
Birds	12	Deer	1
Insects	6	Mammals	1
Wild animals (foxes, wild boar, hedgehogs, squirrels, bears etc.)/wild animals/predators	4	Wolves	1
Fish	4	Rabbits	1
Animal diversity/different animals	2	Marine animals/other sea creatures (mussels, whales, jellyfish)	1
Bees	2	Farm animals (cows, pigs, chickens, sheep)	1
Other insects and spiders (spiders, flies, mosquitoes, fireflies/ants)	1	Other	2

Plant life – subcategories (44 %)

Data in percent		Data in percent	
Plants in general	27	Grass/grasses/lawns	2
Trees	17	Foliage/autumn leaves/leaves	1
Flowers	9	Herbs/medicinal/wild herbs	1
Fungi	3	Moss	1
Plant diversity/different plants	2	Other	1
Shrubs/hedges/bushes	2		

Recreation, leisure & experiencing nature – subcategories (38 %)

Data in percent		Data in percent	
Good/fresh/clean/healthy air	19	Wellbeing/feeling good	2
Relax/unwind/recharge	13	Sport/movement/sports in nature	1
Quiet/calm/still	8	Fragrance/smell/smells good/good odour	1
Hiking/going for a walk	6	Joy/being happy	1
Freedom	3	Zoo/animal park/wildlife park	1
Leisure/spending leisure time in nature/excursions	3	Holiday	1
Health	2	Other	2

Bodies of water/lakes – subcategories (31 %)

Data in percent		Data in percent	
Lakes	12	Streams/brooks	3
Water/bodies of water	11	Ponds/pools	1
River/rivers	9	Other	2
Clean/clear water	4		

Environmental/nature/animal conservation – subcategories (14 %)

Data in percent		Data in percent	
In need of protection/must be protected/preserved	4	Species conservation	1
Basis for human life/life	3	Protection/preservation of plants	1
Environment/nature conservation	2	Water protection	1
Animal conservation	2	Must be preserved/important for future generations	1
Protected areas	1	Other	4
No chemicals/fertilisers/pesticides	1		

Seas – subcategories (13 %)

Data in percent		Data in percent	
Sea/ocean	11	Dunes	1
Beach	1	Tidal flats	1
Tides/low tide/high tide	1	Other	1

Exploitation – subcategories (11 %)			
Data in percent		Data in percent	
Fields	5	Fields/arable land	1
Agriculture	2	Other	3
Food/fruits/vegetables	2		

Climate – subcategories (10 %)			
Data in percent		Data in percent	
Precipitation/rain/snow	3	Climate	2
Weather	2	Storms/thunderstorms	1
Wind/tornadoes	2	Other	1
Seasons/autumn/winter	2		

Nature/environmental catastrophes & destruction – subcategories (8 %)			
Data in percent		Data in percent	
Climate change	2	Environmental pollution	1
Environmental destruction/destruction/in danger/threatened	2	Will be destroyed by humans/destruction of nature caused by greed	1
Plastic waste/littering in nature	1	Extinction of species	1
Global warming	1	Deforestation/slash and burn	1
Tree/forest dieback	1	Other	4

Sky phenomena – subcategories (6 %)			
Data in percent		Data in percent	
Sun/sunrise/sunset	5	Moon/stars/cosmos	1
Sky/clouds	1	Other	0

Other associations – subcategories (35 %)			
Data in percent		Data in percent	
Living beings/life	5	No traffic/no cars	1
Everything that has not been created/influenced by human beings	5	Ecosystem/environmental	1
Green/lots of greenery	4	Expanse/horizon/vastness	1
Species diversity/diversity/very diverse	4	Peace	1
Human beings	3	Homeland	1
Beauty	2	Cleanliness/clean in general	1
Education/learn something/learn something new	1	Other	9
No people/isolated	1	Unknown/nothing	1
Bright/colourful	1	Do not know	0
Earth/our earth	1	No information	0

A4.2 For each of the following statements, please tell me whether you agree with it strongly, somewhat, not really or not at all.

1) Personal significance of nature (Figure 15)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
It makes me happy to be out in nature.	59	35	5	1	0
The wilder the nature, the better I like it.	30	45	20	4	1
I do not feel comfortable in nature.	5	5	13	76	1

2) Perception of the endangerment of and attitudes towards nature (Figure 17)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
We may only use nature in such a way that affords coming generations the same opportunity.	75	22	2	1	0
It is up to man to protect nature.	75	20	4	1	0
Nature conservation is necessary in order to meet the challenges of climate change.	65	28	4	2	1
It angers me that so many people treat nature so recklessley.	63	28	7	2	0

3) Nature conservation caught between politics and economics (Figure 18)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
In times of economic crisis, nature conservation also has to make do with less money.	13	33	32	18	4
Nature must not be allowed to stand in the way of economic development.	8	18	41	30	3

The connection between humans and nature 2017

For each of the following statements, please tell me whether you agree with it strongly, somewhat, not really or not at all.

1) Personal significance of nature (2017)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
It makes me happy to be out in nature.	53	40	6	0	1
I do not feel comfortable in nature.	4	8	17	71	0

2) Perception of the endangerment of and attitudes towards nature (2017)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
We may only use nature in such a way that affords coming generations the same opportunity.	68	28	4	0	0
It is up to man to protect nature.	63	32	4	1	0
It angers me that so many people treat nature so recklessley.	47	41	11	1	0

3) Nature conservation caught between politics and economics (2017)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
In times of economic crisis, nature conservation also has to make do with less money.	19	43	28	7	3
Nature must not be allowed to stand in the way of economic development.	9	22	43	22	4

Chapter 5: Energy transition

A5.1 Do you think the energy transition towards predominantly renewable energies is the right way to go? (Figure 20)

Data in percent	
Yes	60
Undecided	29
No	8
I do not know/no answer	3

A5.2 If we use more renewable energies in the future, it will lead to changes in our landscape. How do you evaluate the possible increase ... (Figure 22)

Data in percent	I think this is good	I would accept this	I would not like this	I reject this suggestion	Do not know/ no answer
... of solar panel systems on buildings?	58	35	5	1	1
... of wind turbines out at sea?	37	41	12	9	1
... of wind turbines on the North and Baltic Sea coasts?	32	44	15	8	1
... in the number of underground power cables?	30	48	15	4	3
... of the land on which rapeseed is grown?	25	44	20	8	3
... of the land on which maize is grown?	24	41	22	11	2
... of on shore wind energy plants?	23	47	20	9	1
... of solar panel systems on meadows and fields?	21	40	28	10	1
... in the number of biogas plants?	18	43	24	9	6
... in the number of overhead power lines?	5	33	39	22	1
... in felling of forest and woodland?	4	18	37	40	1

A5.3 Please rate the following statements. (Figure 21)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Do not know/no answer
The energy transition is necessary in order to counteract climate change.	46	29	17	5	2	1
The energy transition is necessary to make Germany less dependent on importing energy and energy sources (e.g. oil and gas) from other countries.	35	36	21	5	2	1
The energy transition in Germany is a real community project.	28	31	23	9	4	5
The energy transition sets Germany apart from other countries.	26	32	25	8	3	6

Chapter 6: Genetic engineering

A6.1 We would now like to ask you some general questions on the new genetic engineering processes. These new processes make it possible, for example, to switch genetic material on and off or to rewrite it, and to combine genetic material in a targeted way using the modular principle. In the press, these processes are also referred to as genome editing, CRISPR/Cas or gene scissors. To what extent do you agree with the following statements? (Figure 25)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	80	15	4	1	0
Wild animals and plants should not be genetically modified.	66	24	6	2	2
We are not yet in a position to foresee the long-term effects of these new genetic engineering processes.	63	25	6	1	5
I don't think man has the right to genetically modify plants and animals.	55	29	11	3	2
I trust scientists when they say that new genetic engineering processes are safe.	8	28	37	24	3

A6.2 Please tell me whether you consider the following action to be very important, somewhat important, somewhat unimportant, or completely unimportant. (Figure 23)

Data in percent	Very important	Somewhat important	Somewhat unimportant	Completely unimportant	I do not know/ no answer
The use of genetically modified organisms in farming will be banned.	44	37	11	2	6

A6.3 Please assess the following statements on the topic of genetic engineering in farming. Do you completely agree, somewhat agree, somewhat disagree or completely disagree with this statement? (Figure 24)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
In my opinion, commerce should label foods made of animals that have been fed genetically engineered feed.	79	16	4	1	0
I think that genetic engineering in agriculture is an important building block in the struggle against world hunger.	10	25	37	21	7
I don't have a problem with eating genetically modified food.	7	15	27	48	3

Chapter 7: Digitisation

A7.1 How do you feel about the following topics? (Figure 26, 27)

Data in percent	Many oppor-tunities	More of an opportunity	Partly opportuni-ties/partly risks	More of a risk	Many risks	Do not know/no answer
There is currently a lot of discussion about digitisation. Some people emphasise the opportunities, others the risks. How do you personally feel about it?	9	23	44	17	4	3
And if you now think about nature conserva-tion: Do you think that digitisation provides more opportunities or poses more risks?	9	28	36	16	3	8

A7.2 To what extent do you agree with the following statements? (Figure 28)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Do not know/no answer
Nature conservation should try to make better use of the opportunities offered by digitisa-tion.	20	37	26	8	2	7
I can imagine myself using an app to find out about nature endangerment, the success of nature conservation or possible actions I could take to protect nature.	16	28	23	14	18	1

Chapter 8: Awareness of biodiversity

A8.1 Are you familiar with the term "biological diversity"? (Figure 32)

Data in percent	
I've heard of it, and I know what the term means.	45
I've heard of it, but I don't know what the term means.	39
I've never heard of it.	16

A8.2 Can you please tell me what the term "biological diversity", means to you? (Open question, multiple answers possible) (Filter: only people who have heard the term "biological diversity" and know what the term means.) (Figure 35)

Data in percent	
Diversity of species (animals and/or plants)	93
Diversity of ecosystems, habitats	64
Diversity of genes, genetic information, genetic makeup	42
Other	1

A8.3 How convinced are you that biodiversity on earth is in decline? Are you ... (Figure 36)

Data in percent	
Very convinced	43
Somewhat convinced	39
Undecided	16
Not very convinced	2
Not at all convinced	0

A8.4 The Federal Republic of Germany has committed itself in international agreements to the preservation of biodiversity. To what extent do you personally consider the preservation of biological diversity to be a social priority? Would you say, ... (Figure 37)

Data in percent	
Yes, it's a social priority	43
Something of a priority	34
In some ways yes, in others no	18
Not really	4
No, it's not a social priority	1
I do not know/no answer	0

A8.5 I will now read out some statements about biodiversity. Please tell me in each case to what extent you agree with the statement. (Figure 38)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Do not know/ no answer
Climate change threatens biodiversity.	54	36	6	2	2
Biodiversity in nature promotes my wellbeing and my quality of life.	43	44	10	1	2
The amount of land used for settlement, trade & industry and transportation routes should be reduced to preserve biodiversity.	35	46	13	2	4
It will affect me personally if biodiversity disappears.	29	45	19	4	3
Poorer states should receive financial support from richer states in order to protect their biodiversity.	29	47	15	5	4
I feel personally responsible for the preservation of biodiversity.	18	41	29	9	3

A8.6 I am now going to read you some options on what you can do personally to protect biodiversity. How willing are you personally ... (Figure 40)

Data in percent	Very willing	Somewhat willing	Not very willing	Not at all willing	Do not know/ no answer
To switch your brand of cosmetics or health & beauty items when you discover that their manufacturing jeopardises biodiversity?	54	33	9	2	2
To use a guide when shopping, for example, so that you are informed about endangered fish species?	34	40	18	7	1
To draw the attention of your friends and acquaintances to biodiversity conservation?	34	49	13	3	1
To keep informed about current developments in the field of biodiversity?	32	51	13	2	2
To donate money to the care and maintenance of a protected area?	16	41	27	15	1
To participate actively in a nature conservation association in order to help conserve biodiversity?	10	32	36	21	1

List of footnotes

10 The BIK regions are a nationwide spatial classification system that represents the city-surrounding area relationships at the municipal level for metropolitan areas, urban regions, mid-sized and sub-centres. The data basis for the interconnected relationship is formed by the commuter data of employees subject to social security contributions and the population at the site of the main dwelling to determine the percentage of inbound and outbound commuters. 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 two of the seven regional size classes were combined together for the analysis of the data , as otherwise the case number of individual regional size classes would be too low with a sample size of around 2,000 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). 22

11 In the 2009 and 2011 Nature Awareness Study, differences in subgroup response rates with deviations of five percent and ten percent from the mean, respectively, were statistically significant. In the current study, as in the 2013, 2015 and 2017 Nature Awareness Studies, the significance was tested using the chi-square test, which promises more valid results at averages below 20 percent or over 80 percent. 22

12 The percentages of the categories (such as "protected area categories") are not obtained by adding the subcategories (such as "nature reserve", "water protection area", etc.), since individual respondents could give multiple responses. Subcategories are named as examples in the text and are listed in detail in the statistics. 23

13 This is shown not least by international monitoring programmes with strong participation of non-scientists (Citizen Science). See also the statements of the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES; www.ipbes.net/sites/default/files/downloads/pdf/2017_pollination_full_report_book_v12_pages.pdf). A platform such as the Euro Bird Portal (www.eurobirdportal.org) brings together data on the incidence of different bird species across Europe. 38

14 Many trees (third most mentioned) are also flowering plants (angiosperms, for example, the cherry blossom). Some trees, however, are not flowering plants in the narrower sense, but gymnosperms (for example pine, fir trees). "Tree" denotes a growth habit (in addition to shrub, semi-shrub, herb, etc.). Trees were offered as an independent category for selection due to their great importance for the ways in which humans experience nature. 40

15 The survey results on attitudes towards nature and the personal importance of nature were not published in the 2017 Nature Awareness Study brochure due to lack of space. For follow-up purposes, these data are compared here with the new data from 2019 and have been published in the basic count appendix. 44

16 The percentages of the categories (such as "Animals/living beings") are not obtained by adding the subcategories (such as "animals in general", "birds", "insects" and "fish"), since individual respondents could give multiple responses. Subcategories are named as examples in the text and are listed in detail in the basic count. 45

17 At this point one could draw attention to the anthropocentric character of the concept of nature: From a cosmic point of view, the blue planet represents a tiny part of the cosmos – and the cosmos could with some justification also be referred to as nature – but for us humans it is not the "infinite expanse" of the universe that counts, but rather life on earth. 46

18 Against the background of the already-mentioned sustainability barometer (high general approval for the energy transition but increasing criticism of its implementation), it could be useful to distinguish between attitudes towards the energy transition in general (including its goals and promises) and the type and status of implementation in future nature awareness studies. 54

19 Deoxyribonucleic acid, a double strand of nucleic acids that forms a double helix and is the carrier of genetic information. 68

20 The development, operationalisation and concrete calculation of the social indicator can be found in Kuckartz and Rädiker (2009). An explanation of the procedure and a comprehensive discussion of the findings are presented in the in-depth report concerning the social indicator (publication in autumn/winter 2020). 69

21 The following definitions were read out to respondents: In the scientific community, biodiversity means firstly the diversity of genetic information and genes, secondly the diversity of animal and plant species and thirdly the diversity of habitats and ecosystems. 74

22 This item was added to the set of questions on biodiversity for the first time in the 2019 survey, but is not taken into account when calculating the social indicator. 75