Swiss Natural History Collections Network

Mid-Term Retrospective and Outlook

December 2022

Swiss Academy of Sciences (SCNAT) · Swiss Natural History Collections Network
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1. Executive Summary

The overall goal of the Swiss Natural History Collections Network (SwissCollNet) initiative aims at making data on specimens from the Swiss natural history collections available for research, education and society. SwissCollNet will mobilise and provide open-access to specimen data through nationwide data harmonisation and interoperability among all relevant stakeholders and data providers, such as natural history museums, botanical gardens and institutions of higher education. The foremost and overall goal of this four-year period is to identify, priories and digitise as many collections as possible and to build an online portal, the Swiss Virtual Natural History Collection (hereafter SVNHC), which will provide open-access to harmonised specimen data from the Swiss collections, for both, the national and international science community.

1.1. Project progress report (January 2021 – December 2022)

Since the beginning of SwissCollNet on January 1st, 2021, the following milestones have been reached:

- **A collaboration network** throughout the Swiss collection holding institutions has been established successfully, resulting in **68 projects approved** through two calls (Fall 2021 and Summer 2022) addressing the conditioning and digitizing needs of a wide variety of natural history collections, funded with a **total of CHF 8'874'000** and **own/in-kind contributions of CHF 9'748'000**.
- **115 museum professionals,** distributed over 53 institutions and 21 cantons, are acting as **project leaders (main- and co-grantees)** in one or several projects.
- **A Handbook on Natural History Collections Management** was established by SwissCollNet (Frick & Greeff 2021) and is a significant achievement and mandatory guideline for project submission.
- An extensive **survey of the number and kind of collections** housed by collection-holding institutions across Switzerland was carried out, providing **metadata of approximately 44 Mio. specimens** (out of the nearly 61 Mio. country-wide specimens) and were or are being introduced into the Global Registry of Scientific Collection data portal (**GRSciColl**).
- **A user survey and a pilot project** on the implementation and the publication of digitized collection data in the **National Data Aggregator, the Swiss Virtual Natural History Collection** (SVNHC) has been established, including the expertise of the Swiss Institute for Information Science (SII) of the University of Applied Sciences Grisons (Chur).
- **Data models** for biological natural history collection data, as well as Earth science and anthropology collection data are being evaluated for adaption and integration into the SVNHC and exchange to international data portals such as the Global Biodiversity Information Facility (GBIF.org) and the Geoscience Collections Access Service (GeoCASe).
- **A national strategy for Swiss natural history collections** is being developed by the Swiss community.

Outlook beyond 2024: Concepts on the future structure and funding of SwissCollNet/SVNHC and ongoing conditioning and digitizing activities within the natural history collection community are currently under development.

1.2. Project management progress report (January 2021 – December 2022)

For the overall management of SwissCollNet different governing levels were established:

- **Scientific Unit (SU),** within SCNAT: is responsible for research management and coordination of the project. This included the elaboration of the project implementation plan, the organization and evaluation of the two subsequent project calls in fall 2021 and summer 2022, the integration of 63 international experts in the evaluation process, the financial management of the approved projects, the implementation of the SVNHC pilot project as well as various workshops besides other organizational and managerial tasks.
- **National Steering Board (SB):** is the highest governing level and decision-making authority of SwissCollNet. It is responsible for the overall strategy and progress of the project, the business plan and budget, the allocation of funds and relations with all involved stakeholders, including political authorities.
- **Board of Experts (BoE):** provides the technical know-how, advises the SB and organizes specialist working groups on demand.
- **Specialist working groups:** encompasses experts working in museums and institutions of higher education with experience in the fields of systematics/taxonomy, collection management, databasing, training, etc. Of particular significance is the working group for the development of the National Data Aggregator SVNHC.

1.3. Preliminary Conclusions and Outlook

SwissCollNet is the **key to a national scientific treasure and consequently digital repository on long-term biodiversity and Earth science data**.

So far, the initiative has been a key in forming a more strongly connected community around natural history collections in Switzerland as it serves as a hub for information exchange at a national level. It also facilitates the standardisation of our approaches to collection management as described in the "Handbook on natural history collections management" by Frick & Greeff (2021) and data mobilisation (data capture, data standards, digitisation protocols) making what we do compatible on the national as well as international level. Further, the SwissCollNet initiative enhances skills-transfer between institutions and promotes training opportunities for both the staff already in the institutions, but also for the newly hired staff.

The integration of the digitized natural history collection data into the already existing infrastructures of the Swiss Information Center for Species **(InfoSpecies)** and **GeoCASe**, as well as the connection of information on collection specimens with information on (living) species observations, is **crystallizing as the most realistic and straightforward approach to achieve the goal of setting up the National Data Aggregator SVNHC**. This approach will impressively enhance the availability of information that is essential to achieve our societal and environmental endeavors, such as mitigating climate change and reducing biodiversity loss. It also represents a straightforward approach to link our national collection data to international collection data portals and thus contributes to the global biodiversity/geodiversity knowledge network. As such it also strengthens the standing of the Swiss research community within the international research community.

At present, business cases are developed to form a national platform for the natural history collection network, resulting in an umbrella organisation to

a) develop data models and the data infrastructure,

b) enhance ongoing conditioning and digitisation of collections and specimens,

c) intensify the exchange between existing experts as well as the recruiting of new experts for different groups of taxons,

d) further deepen the international connections.

e) establish natural history collections as the missing link between our cultural and our scientific heritage. Natural history collections count among the oldest collections and mark the beginning of museums, based on the cabinets of wonders created by universal scholars (Universalgelehrte) as early as the 16th and 17th centuries.

2. Switzerland's natural history collections - a treasure trove of knowledge with great potential

Natural history collections are a national patrimonial, cultural and scientific asset (Beer et al., 2019). If one wants to understand the long-term development of ecosystems and environmental processes, one must be able to look at the longest possible periods of time. Objects in natural history collections contain this knowledge implicitly, as many of these collections were created decades to centuries ago. For biological collections, species discovery and documentation originate from the field collection and study of specimens. Specimens hold morphological, anatomical, structural, ecological, phenological or chemical information that is used to describe new species and build-up the understanding of species themselves as well as on how these species fit within the tree of Life. Specimens also provide information on which organisms were present in a certain region at a certain time and how the composition or distribution of organisms may have changed. They can also be used for a number of other types of research that require physical specimens, such as the study of known or emergent diseases or pests, the effects of pollutants on organisms. **In view of today's rapid development of molecular genetic analysis methods, natural history collections have become extremely important for assessing the long-term development of biodiversity** - of historical, current and future developments. Natural history collections represent a time continuum and continue to develop in scientific value as new specimens are added. Each specimen is a reflection of its time and the environmental conditions prevailing at that time. Increasingly, ancient specimens can be analysed with molecular genetic methods adding to our understanding of species and their evolutionary histories. The very fact that we have knowledge of species at a precise place and time helps us to better capture and quantify the loss of biodiversity. This data can be used as a reference. Thus, the combination of traditional and modern field collection and analysis methods (e.g., eDNA) and the use of biobanks are creating added value in terms of knowledge that will be of increasing importance for Swiss environmental research as well as the positioning of Swiss research in the international research landscape. **SwissCollNet is the key to a national data treasure of inestimable value**, for research and for society, on both the biodiversity and geodiversity in Switzerland through its rich and diverse collections of Swiss specimens, but also worldwide due to the important international collections held in Swiss natural history collection institutions.

Institutions that develop and maintain natural history collections and make them accessible to society and research assume responsibility for the preservation, further development and communication of scientific values. As irreplaceable records across time and space, specimens of plants, animals, fungi, microorganisms, fossils, rocks, minerals and meteorites document the composition and richness of nature on Earth, the profound changes in our environment over the past decades and centuries and the evolution of the geo-sphere and of space. Their management and preservation over time and their scientific use are therefore the top priorities for natural history institutions (natural history museums, botanical gardens, scientific research centers).

In legal terms, Switzerland's Federal law on the 'Protection of cultural assets in the case of armed conflicts, disasters and emergencies' (Bundesgesetz 520.3) specifies that collections, and specifically natural history collections, are cultural goods. However, it contains no binding provisions to ensure their long-term conservation under non-conflict situations, neither does the Confederation contribute financially to the maintenance of this natural heritage asset. Thus, the preservation, accessibility and adequate curation of natural history collections in Switzerland, under normal circumstances, are not secured nationwide over the long-term. Natural history institutions are generally funded by the administrations of the city, canton or region in which they are located, and some seek additional funding from other sources, such as the Federal Office of Culture (i.e., provenance research / Provenienzforschung) or from private foundations, to support their activities. As a result of this federalist system, the responsibilities for curating and preserving these collections are dispersed and are potentially also disparate.

The value of natural history collections comes to the forefront when they are recognised as a potent educational and scientific tool, and are easily accessible. In this respect, the Swiss natural history institutions do very valuable work with their attractive permanent and temporary exhibitions as well as their extensive outreach and education programs. However, although they host many scientific visitors to study the specimens in situ and participate in the global exchange of specimen loans, they have only had the capacity to provide digital access to a small part of the nearly 61 million objects in Swiss collections.

Today's digitisation techniques make it possible to present collection objects in such a way that they can be used for a wide variety of applications: school lessons, museum education, environmental observation and analysis, university teaching and scientific research. Thanks to digitisation, access to collections and specimen-based information is democratised.

On an international scale, the value of natural history collections and the importance of access to digital information of specimens has been recognized. With the Consortium of European Taxonomic Facilities (CETAF), Europe founded a network of biological and geological collections in 1996 that aimed to act as a driver in support of collections and taxonomy in and across Europe. Today, 71 European institutions from 23 countries are members of CETAF. They house approximately 1.5 billion specimens including over 80% of the described species worldwide and are jointly promoting scientific research and open access to European collections, fostering European cooperation and partnerships and providing expertise for taxonomy and systematic biology through training. To promote digital access of specimens, the Distributed System of Scientific Collections (DiSSCo), a new Research Infrastructure (RI), created from within CETAF, aims to create one European collection that digitally unifies all European natural science assets under common access, curation, policies and practices that ensure that all the data is easily Findable, Accessible, Interoperable and Reusable (FAIR principles). DiSSCo represents the largest ever formal agreement between natural history museums, botanical gardens and collection-holding universities / institutions in the world. DiSSCo is in the transition phase with the formation of its legal structure as an European Research Infrastructure (ERIC) and it will become operational in 2025. DiSSCo will have a strong link to the GBIF and the CETAF Earth Science Collections Portal GeoCASe. GBIF is an international network and data infrastructure funded by the world's governments (including Switzerland, see below) and aimed at providing anyone, anywhere, open access to data about all types of life on Earth. It provides data-holding institutions around the world with common standards, best practices and open-source tools enabling them to share information about where and when species have been recorded. This knowledge derives from many different kinds of sources, including everything from museum specimens collected in the 18th and 19th century to DNA barcodes and smartphone photos. GeoCASe is an initiative driven by the Earth Science Group in CETAF. It is a data network and web portal designed to make collections of minerals, rocks, meteorites and fossils held in museums and research institutions universally available online, in order to foster scientific research and collaboration internationally.

These international efforts towards unifying and making accessible bio- and geodiversity data at a global scale are also strongly supported by the Swiss bio- and geodiversity community. Switzerland is member of GBIF.org since 2001, the Swiss node of GBIF being run by the Swiss Centre for the Cartography of Fauna (info fauna), and financed with federal funds. Furthermore, the Swiss Academy of Sciences is running the initiative Swiss Natural History Collections Network (SwissCollNet) from 2021-2024 and the Swiss Research Community has declared a national infrastructure, the SwissBioCollection as one of the four priority infrastructures to be built in the next Education and Research Infrastructure period 2025-2028 (Brunner et al., 2021). A national project proposal (SwissSpecimen) was submitted to Swissuniversities in the framework of the 'Roadmap for Research Infrastructures 2025-2028', in which 16 institutions and 45 applicants have proposed to develop a common umbrella for the generation and exchange of scientific information with the highest technical and ethical standards for all Swiss collections, and to enable a pooling of knowledge and expertise within a broad network in biology, geosciences and medicine. The SwissSpecimen infrastructure proposal, which was submitted in 2021 to the "Roadmap Research Infrastructure 2023" call with the aim of bringing together SwissCollNet and the Swiss Biobanking Platform (SBP). It would unite natural history collections and biobanks, but also living collections at a national level (see also chapter 8.3.2).

3. The Swiss Natural History Collections Network – a first step towards a National Swiss node of collection data

The natural history collections are particularly valuable for research and environmental observation, especially because they are distributed throughout Switzerland and, with their (partly) regional collection objects, represent the country's natural landscape and species spectrum. The Swiss Academy of Sciences (SCNAT) together with the partner organisations of Verband der naturwissenschaftlichen Museen und Sammlungen der Schweiz und Liechtenstein (Musnatcoll), the Swiss Systematics Society (SSS), the Swiss Node of GBIF (GBIF.ch)

and InfoSpecies have recognised the great potential of these collections and have therefore campaigned for their digitisation in recent years. The initiative, based on the previous evaluation of the status of collections in Switzerland, seeks to promote the scientific potential of Swiss natural history collections for scientific research, education and society as well as to foster the development, maintenance and financial support of natural history collections within the framework of a common and widely endorsed national strategy (Beer et al., 2019). After intense preparatory work, it is now executing the comprehensive digitisation project SwissCollNet between 2021 and 2024, for which the Swiss Confederation has provided a total of CHF 12.37 million CHF. Participating institutions are contributing equally as part of their grant agreements. In a competitive process with two calls for proposals, projects from collection holding institutions that address various aspects of the cataloguing and digitisation of collections have been financed. The prerequisite for financial support is an equal contribution is made from the institutions or their trustees. With impressive commitment, the collection institutions submitted 74 funding applications resulting in 68 projects, for a **total of CHF 8'874'000** and **own/in-kind contributions of 9'748'000**. From the diverse network of small and large Swiss collections (**Figure 1**), an extensive virtual natural history data collection with great charisma and diverse benefits is being created.

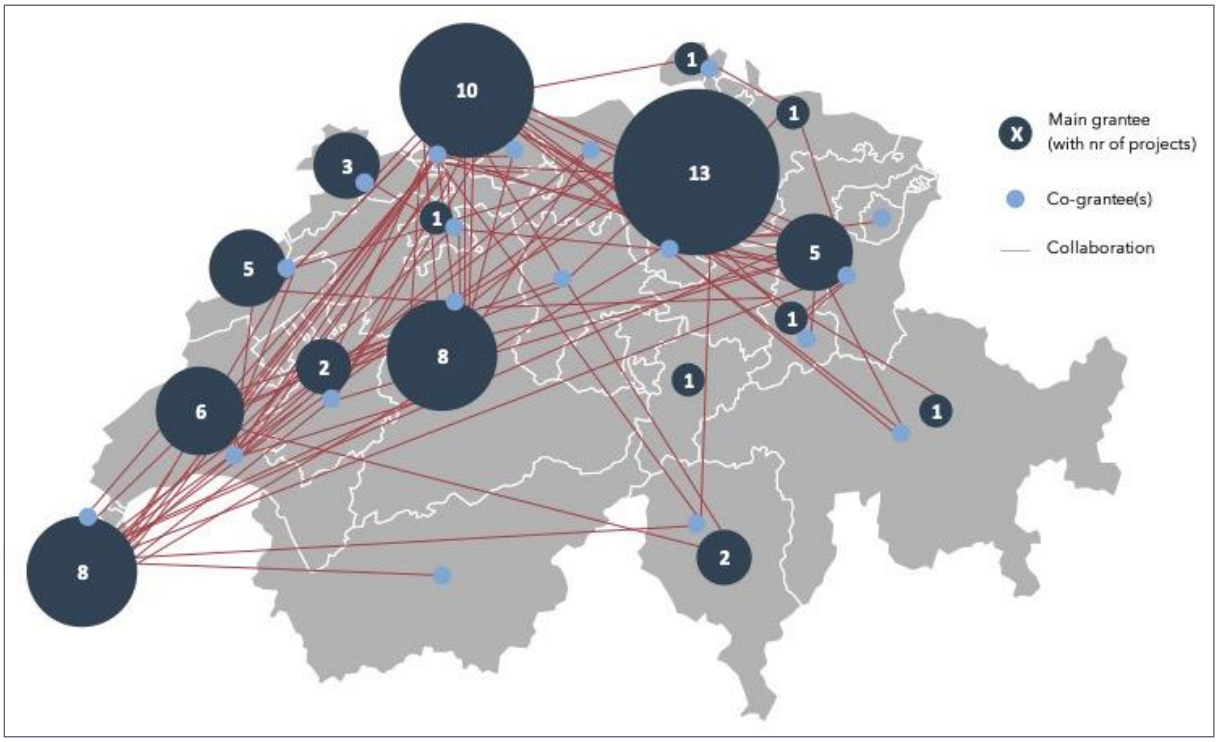

Figure 1: Distribution and collaborations within the 68 projects. Main-grantees (dark blue) and co-grantees (light blue) represent 115 persons located in 53 institutions and 21 cantons of Switzerland. Joint projects are marked with red lines and only reflect collaborations between main-and co-grantees and do not show collaborations between co-grantees.

The State Secretariat for Education, Research and Innovation (SERI) is limiting the funding of SwissCollNet, in the sense of it providing start-up funding, to the years 2021-2024 and refers to the responsibility of the cantons for the work that will be necessary subsequently. Many institutions with natural history collections are supported by cantons or municipalities and are often within the responsibility of departments or divisions with a cultural and/or educational mandate. However, the digitisation of Switzerland's natural history collections is a long-neglected task that will require sustained financing and as it will take much more time than the four years approved for SwissCollNet to complete this task and fully moblilise data into the unique national database and virtual catalogue.

At the interface between cantonal (culture, education) and national responsibility (research, environmental monitoring), possibilities for long-term sponsorship of this initiative must be explored so that this unique scientific and cultural treasure can be used comprehensively and extensively in education and research in the future.

4. General aim of SwissCollNet with a long-term view

The long-term goals of the natural history collection-holding institutions of Switzerland are to reach sustainability for their preservation, curation and future development, to promote the physical and digital accessibility of their collections for fundamental and applied research, use the collection to contribute to education and society, to build a strong network connected to the international initiatives, and to exchange and develop knowledge. These goals are being consolidated in a 10-year strategy that fosters the importance and use of the natural history collections in Swiss institutions.

Within this context, the main objectives of the four-year period of SwissCollNet are to modernise and digitise the collections and provide open-access to harmonised specimen data through an online portal, the Swiss Virtual Natural History Collection (SVNHC). To this end, the available funds are invested in the development of the SVNHC as well as to condition, integrate, update and digitize collections in Switzerland. Furthermore, a strategy is being developed to guarantee the sustainable operation of the SVNHC thus providing long-term access to an increasing volume of specimen data and ensuring international alignment.

Achievements of the SwissCollNet-initiative will be integrated into an organisation and infrastructure with long-term perspectives.

5. Goals and milestones of the funding period of SwissCollNet (2021-2024)

Goals and milestones of the four years funding period of SwissCollNet are presented in the 'Implementation Plan 2021-2024' and summarised hereafter (**Figure 2**).

Goals of the first year (2021) of the initiative were to set-up the governance and rules of procedure, outline an implementation plan, put in place regulations and an evaluation procedure for project proposals, formulate and publish a first call for project proposals for Swiss public and non-profit collection-holding institutions, conduct a survey to obtain meta-information on collections housed in Switzerland, perform a preparatory study for the development of the SVNHC, and foster collaborations in the framework of the SwissCollNet initiative.

In the second year (2022), emphasis was mostly put on the evaluation of **49 project proposals, resulting from the first call**, followed by **25 project proposals** submitted to the **second call. In parallel** the preparative work for the **construction of the SVNHC** was performed. Furthermore, **metadata describing collection units with a total of approximately 44 Mio specimens were captured** and collections are being registered in the Global Registry for Scientific Collections (example: Natural History Museum Basel).

The third year (2023) will mostly be dedicated to collection management, digitization and training in the institutions participating in SwissCollNet. In addition, the development of the national data aggregator for natural history collections SVNHC will be started and a long-term organisation for the infrastructure will be set-up. Also, work on the National Strategy for Natural History Collections will be intensified. Implementation of standards for the management and digitization of natural history specimens will be performed with collective trainings in workshops as well as individual trainings in the framework of the single projects running in numerous institutions.

In the fourth year (2024), the numerous projects will terminate in the second half of the year. Digitization records will be transferred to the SVNHC and the long-term organisation of the infrastructure as well as the National Collection Strategy will be implemented.

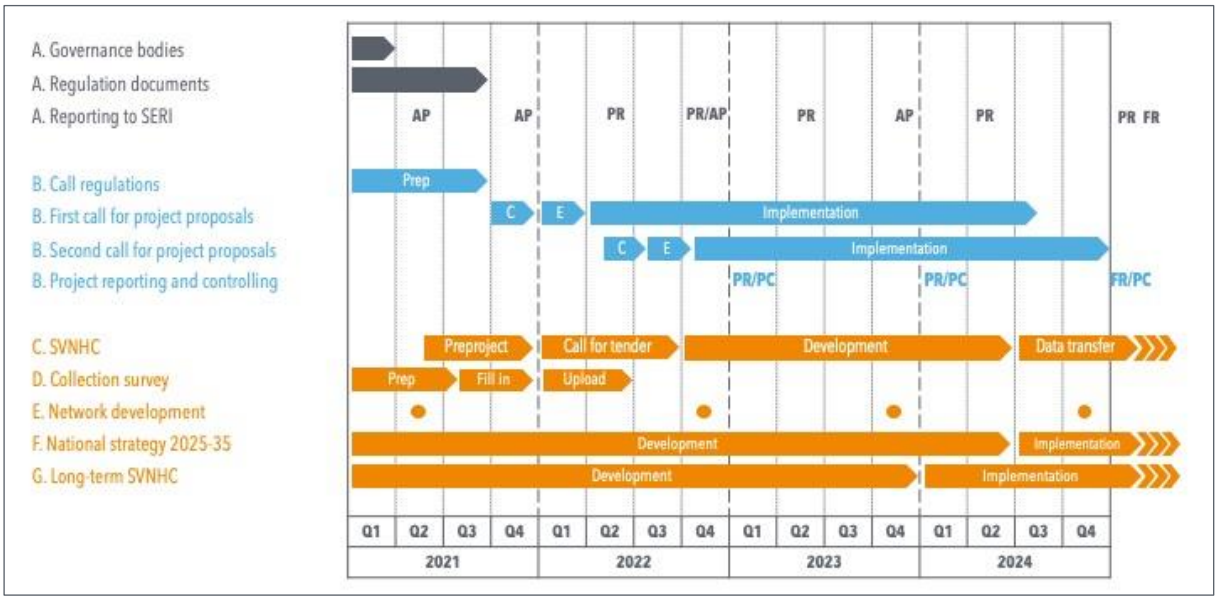

Figure 2: Implementation plan with the milestones of the SwissCollNet initiative: (A) governance, regulations and reporting, (B) call for projects, international evaluation and realization of the projects in the collections, (C) development of the Swiss Virtual Natural History Collection, (D) generation of metadata on collections curated in Switzerland, (E) network development and training, (F) development and implementation of a National Strategy on Natural History Collections 2025-2035, (G) set-up of a long-term governance of the SVNHC.

6. Milestones reached (2021-2022)

6.1. Governance of SwissCollNet

A solid governance structure with the Research Management / Scientific Unit, a Steering Board (SB, 12 members), a Board of Experts (BoE, 6 members) was established. Working groups and single experts supplement the governance bodies punctually. Rules of procedure have been agreed and published. Furthermore, funding regulations have been formulated and released. An implementation plan has been formulated.

6.2. Individual projects in public natural history collections

Announcements for two calls for project proposals have been formulated and published. Also, procedures and tools for the submission of project proposals as well as the evaluation processes and management of supported projects have been established. In total, 74 projects have been thoroughly evaluated with the involvement of 63 international experts and the Steering Board of SwissCollNet. By the end of the 2022, 44 projects were started and 24 projects are about to start. Of the projects that were rejected in the first call, 4 projects were successfully revised and could be accepted in the second call. Out of the 68 projects financed, 27 are projects taking place in a single institution and 41 projects are collaborations between at least two institutions. The 53 institutions participating in one or several projects are located in 21 cantons of Switzerland. 115 grantees and co-grantees are involved in one or several of the 68 financed projects (**Figure 1, Figure 3**).

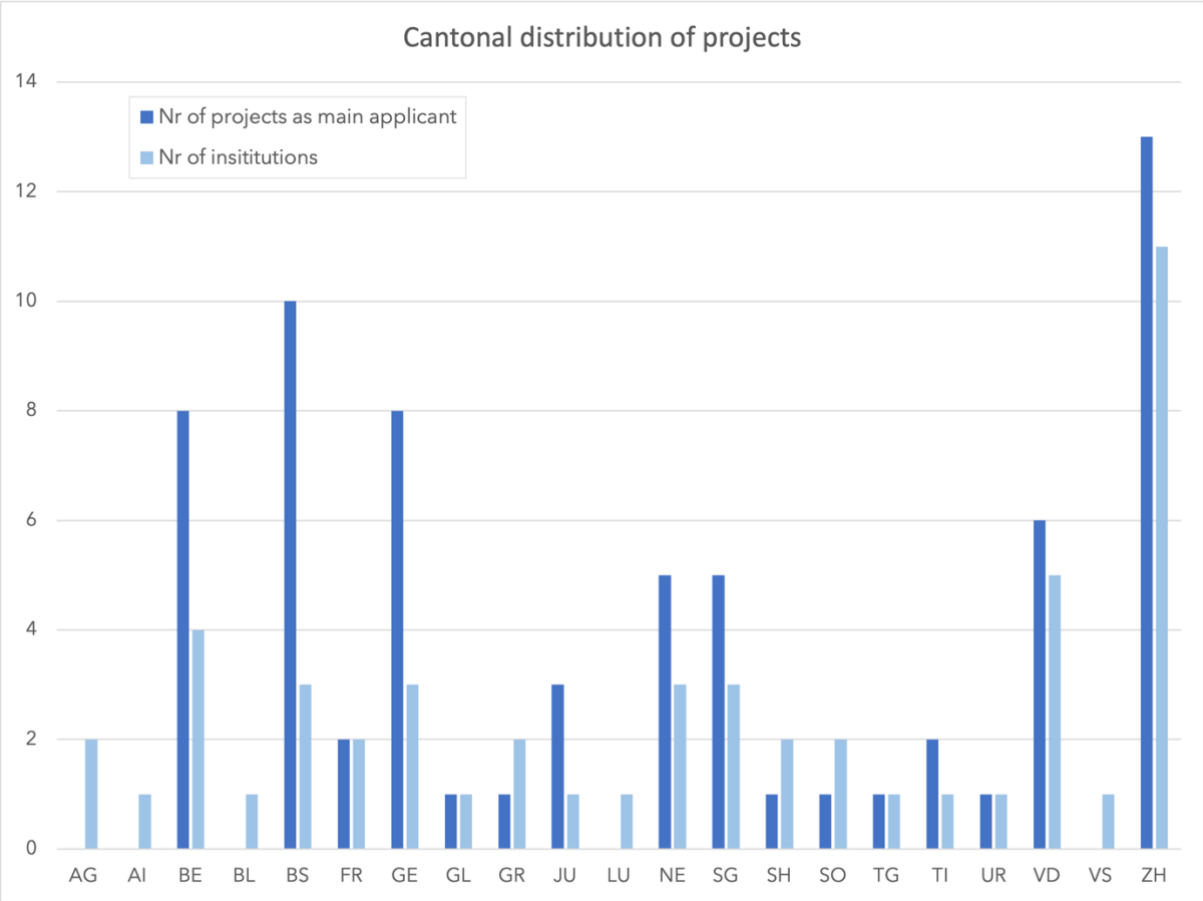

Figure 3: Projects that will be performed in the collection holding institutions are widely distributed. 53 institutions located in 21 cantons are participating in the projects. The cantons which are not listed are cantons with few or no public institution responsible for natural history collections.

Approximately 28% of the financial resources provided by SwissCollNet for the granted projects will be invested into conditioning, management and taxonomic identification of specimens, 61% into digitisation of collections and 8% will be dedicated to the training of collaborators. 3% of the financial resources will be invested for other purposes, for example in the extension of the collection management system Specify for data of geological samples (**Figure 4**).

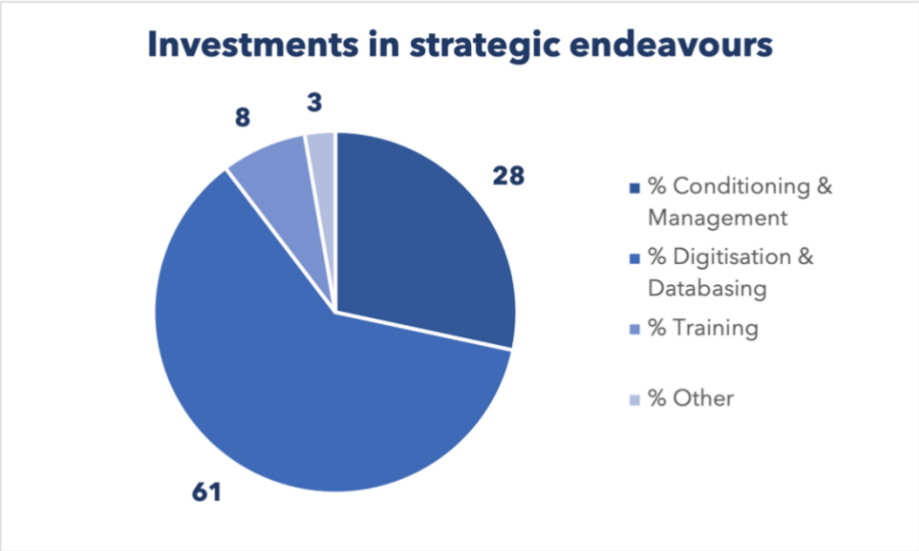

Figure 4: The biggest part of financial contributions from SwissCollNet will flow into the digitisation and databasing of natural history collections, followed by conditioning and managing the collections themselves. A lower amount of finances will be spent directly for training; however a lot of knowledge exchange will take place among the grantees.

The disciplinary distribution of the projects is very broad and covers many organismic groups. A few projects have their focus on minerals and meteorites (**Figure 5**).

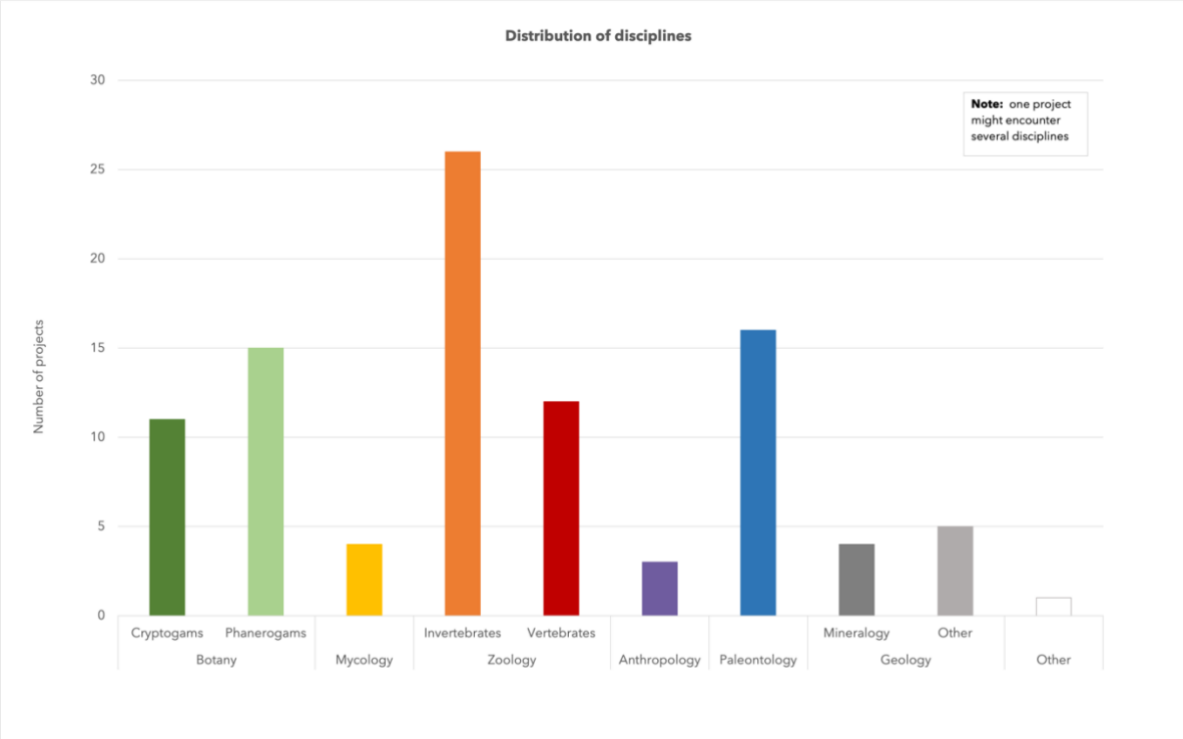

Figure 5: The disciplinary distribution of the projects is wide and reflects to some extent the incidence of the collections.

6.3. Development of the Swiss Virtual Natural History Collection (SVNHC)

In order to identify the most suitable and unbiased solution to increase digital access to collection data currently stored in a decentralised way in numerous public collection-holding institutions, SwissCollNet mandated Ana Petrus and Tobias Wildi from the Swiss Institute for Information Science (SII) of the University of Applied Sciences Grisons (FHGR) to conduct a preparatory study entitled 'Preproject and conceptual design "Swiss Virtual Natural History Collection" (SVNHC)'. The study resulted in a number of scenarios and recommendations and a conclusive statement recommending a focus on data models and vocabularies, and to support and develop upon the existing infrastructures for biodiversity observation data in collaboration with InfoSpecies. As a long-term goal, the natural history collections should be associated with observational data, literature and DNA-data in an "Enriched Dataset" linkage hub.

Following a number of meetings between InfoSpecies and SwissCollNet, and a workshop with representatives of collection holding institutions, researchers and representatives of the different data centres of InfoSpecies, a project and business plan is currently being worked out to integrate collection data of biosciences and palaeontology into the existing infrastructure PICT-IS run by the Swiss node of GBIF. Furthermore, the geoscience community has investigated several scenarios for aggregating collection data of Earth sciences. Collaboration with the CETAF supported GeoCASe, which runs a data aggregator for geological and mineralogical samples, has come out as the most viable solution.

On an international level, SwissCollNet cooperates with the specialised working groups of CETAF to strengthen collaboration and knowledge exchange between Swiss institutions and the CETAF community, with three Swiss institutions also members of CETAF and the executive director as well as the vice-president of CETAF being members of the governance body of SwissCollNet. Musnatcoll has become an associated member of DiSSCo

and is closely following the different steps of implementation of this infrastructure and exchange experiences and knowledge. Additionally, Musnatcoll has contacted the SERI with the request to nominate a representative of the federal administration to represent Switzerland in the Funders Forum of DiSSCo.

6.4. Collection survey

A new matrix (Collection Survey) to register information on collections at the meta-data level has been aligned with GRSciColl and was distributed among the curators of collection-holding institutions in 2021. The institutions have returned information on collections that are to be worked on in the framework of SwissCollNet with many returning the information on their entire collections. While the primary aim of the global register is to ensure the long-term referencing of collection holdings by assigning IDs, the aim of SwissCollNet was also to provide key figures on the scope, condition and development of individual parts of the collections as a basis for tracking curatorial work. The data collected make cross-institutional collection focal points visible on a national level. The objectives of the approach chosen can be summarised as follows:

a) providing international visibility and referencing for Swiss collections via GRSciColl;

b) approaching and monitoring collections that are being worked on within the framework of SwissCollNet projects;

c) Generating a catalogue of collections in public and non-profit institutions in Switzerland.

40 organisations (museums, botanical gardens, research institutions) have so far participated in the Collection Survey and declared more than 250 GRSciColl reference collections with a total of 700 sub-collections. These refer to more than 44 million objects, which means that 70% of the total number of Swiss specimens can be assigned to a registered collection, once the specimens are digitised. The calculations are based on the 2018 overall calculation of 61 million objects held in Swiss collections (Beer et al. 2019). The degree of documentation, especially of the curatorial status at the level of the reference collections, is a work in progress in cooperation with the respective institutions. Based on the comparison of the 2018 institutional figures, gaps in the registration can also be identified: so far, only one third of the palaeontological specimens reported in 2018 are represented in the returns received. All information provided by the collection holding institutions will be published in a synopsis table on the SwissCollNet website.

6.5. Network development, training and communication

Prior to the publication of the first call for project proposals, an information day was organised in which the participants were informed about the rules and procedures for project submission. In addition, sessions were organized to allow for networking and the creation of f collaborations. The event was well attended, the natural history collection community was thus adequately prepared for the elaboration of their project proposals and the interactions facilitated a vast network of collaborations.

Training and education will be achieved is several ways:

a) by increasing exchanges and networking between staff of collection-holding institutions under the numerous collaborative projects;

b) by the life-long-learning approach that will take place as current staff learn new skills on data generation, data standardisation and specimen digitisation;

c) by the training in collections management skills and collections digitisation techniques of staff hired under the diverse range of SwissCollNet funded projects

d) through the production and assembling of protocols and best practices on different types of collections or organisms, in link with the different project that will serve as a set of complementary documents for the Handbook.

With the publication of the Handbook on natural history collections management (Frick and Greeff, 2021) and the set-up of the working group data management, the foundation has been laid for common working procedures and vocabularies to revise and digitise natural history collections. Grantees of SwissCollNet projects have committed themselves to rely on the recommendations published in the Handbook on natural history collections management to execute their projects and to apply the internationally compatible standards ABCD-EFG or Darwin Core (DwC) for the digitisation of the specimens. This will allow for the aggregation and harmonisation of digital information generated by the projects via a common platform, the National Data Aggregator SVNHC. A training workshop on best practices for data management, the use of collection management systems, the application of persistent identifiers and data standards, the transfer of digital information about collections to national and international data nodes and on how to search information on national and international platforms is in preparation and will be held on the 20th January 2023.

Different communication tools have been established to reach the collection community but also a larger public. The webpage of SwissCollNet informs about the initiative and is regularly updated. Furthermore, the stakeholders of SwissCollNet are regularly informed about the initiative with the newsletter SwissCollNet and to reach a larger audience, selected information is distributed within the newsletters of SCNAT and the Swiss Academies of Arts and Sciences.

The state of species knowledge in Switzerland has been classified as alarming for several years. The number of species experts is decreasing considerably. Therefore, attempts are being made at various levels to counteract the loss of competences by expanding the range of educational opportunities and increasing coordination. However, many of these efforts are uncoordinated, without mutual awareness. Several organisations, financially supported by the Federal Office of the Environment and Nature (FOEN), have elaborated the Strategy Education in Species Knowledge (Bildung Artenkenntnisse) in which several members of SwissCollNet were involved. The present strategy brings together the efforts to promote species knowledge and make it available in the long term, and coordinates future action to create synergies. The Platform Biology of the Swiss Academy of Sciences has taken over the patronage of this strategy with several members of SwissCollNet involved in this.

6.6. National Strategy for Natural History Collections in Switzerland 2025-2035

The Swiss National Strategy for Natural History Collections is intended to facilitate the management, curation, enhancement and scientific use of collections in Swiss institutions in a coordinated way, thus enabling access to biodiversity and geodiversity specimens via specimen databasing and digitisation, with linked and open access to both collections and collection-based data supporting the scientific use of natural history collections at home and abroad. Promoting interoperability between collections and collections data, and unified access to collections on a national level creates unprecedented opportunities for scientific collaboration and innovation as well as the development of training and education initiatives. The implementation of a national strategy permits the creation of a country-wide approach to natural history collections, especially their management, enhancement and financial upkeep, thus forming a platform for coordination, communication and collaboration. This nationwide collaborative approach will create an internationally compatible research infrastructure for natural history collections, thus maximizing the impact for science, policy and society.

Piloted by a subgroup of the governance bodies of SwissCollNet, a first draft of the strategy was compiled based on direct contributions from Swiss natural history institutions in 2021. An invitation was sent to the directors of Swiss natural history institutions, via the Musnatcoll membership, to complete a questionnaire on the priorities and challenges for their institutional collections as well as on the key actions needed for the successful implementation of a national history collections strategy. The responses from 26 Swiss institutions were compiled to form the framework of the strategy. It was further developed via consultations with participating institutions and directors who have expressed an interest in working on the development of the strategy. The strategy was also communicated, for comments, to SwissCollNet partner organisations and key Swiss stakeholders.

As a next step, the strategy will be presented and discussed with representatives of Swiss natural history institutions in a SwissCollNet workshop to be held on the 20th January 2023 in Bern.

6.7. Long-term development of SwissCollNet

The overall goal and vision of SwissCollNet is

a) to secure the long-term functioning and expansion of the SVNHC, the National Data Aggregator for natural history collection data covering biology, Earth science and human remains/anthropology,

b) to ensure accessibility of data to all institutions that hold natural history collections, research and teaching institutions as well as governmental authorities within Switzerland and internationally, and

c) to enable the continuation of collection enhancement and digitizing efforts as it will not be possible to treat all natural history collections and mobilise the digital data on the 61 million specimens known to be held in Swiss collections by the end of 2024.

It is evident that a multitude of options will have to be examined and interlinked in order to secure the long-term future of SwissCollNet. One of these options was the development of the SwissSpecimen concept, which was submitted with the support of the University of Geneva to the Roadmap Research Infrastructure 2023 call for the development of biological research infrastructures for the period 2025-2028: **«SwissSpecimen – making Swiss biobanks and natural history collections accessible to science and society»**. The project proposal foresaw the development of a common umbrella for the generation and exchange of scientific information with the highest technical and ethical standards for all Swiss collections and to **enable the pooling of knowledge and expertise within a broad network in biology, geosciences and medicine.** Although the relevance of this comprehensive project was noticed and highly scored by most reviewers, the project was not selected for the last round of evaluation of the RI 2025-2028 process.

As will be shown in chapter 8.3.2 the concept of SwissSpecimen will not be dropped, but will be enhanced and further developed for later submissions in the frame of future Biology roadmaps from 2028 on.

7. Planned actions until the end of 2024

7.1. Individual projects in public natural history collections (period 2023-24)

The core-activities of SwissCollNet until December 2024 will take place in the collection-holding institutions in the framework of the projects, which have been supported by SwissCollNet. Lay summaries of all the projects can be found on the webpage of SwissCollNet (running projects). First results will be available through the intermediary reports of approximately half of the projects due in spring 2023.

7.2. National aggregation and publication of specimen data in the SVNHC

To make digital information about the collections and specimens publicly accessible, data stored in the collection-holding institutions all over Switzerland have to be aggregated and made digitally available. Since the data are of value for a variety of diverse users, they will be fed into distinct national and international platforms such as GBIF and GeoCASe (**Figure 6**).

InfoSpecies unifies seven national data and information centres, which document taxa and their distributions in Switzerland. Observation data from these centres are aggregated and distributed via the Swiss node of GBIF to national and international data platforms. SwissCollNet will closely collaborate with InfoSpecies to connect observation data with data from natural history collections. First contacts have been established and will be further developed. This will result in the making newly acquired data from SwissCollNet accessible through the SVNHC and the use of a common data aggregator together with GBIF Switzerland as shared digital infrastructure and will complement the observational data curated in InfoSpecies. Ultimately, this collaboration represents a great benefit for both institutions, for SwissCollNet as well as InfoSpecies. A first outline of this future structure is presented hereafter.

In regard to collection data from geosciences, requirements of data providers and data users differ considerably from biosciences. Geological specimen types vary by age, chemistry and process. All geological specimens have either transformed (e.g. rocks) or grown (e.g. minerals), so a time series of information is also important. Therefore, for geoscience data, the data aggregator GeoCASe has been developed under the umbrella of CETAF. GeoCASe stands for Geoscience Collections Access Service. It is a data network and web portal for mineral, rock, meteorite and fossil specimens held in museums and research institutions currently based at Tallin University, Estonia. Like its Biological counterpart Biological Collection Access Service (BioCASE) - the CETAF GBIF node - it operates by harvesting data which are indexed to enable rapid search and display. So far, it holds 1.7 million records from 11 institutions and has been accepted as the Geological counterpart of GBIF in DiSSCo infrastructure. In addition, SwissCollNet has granted a project, in which a geology module for geological data in the Specify Collection Management systems will be constructed. SwissCollNet has set up a working group of representatives for Earth sciences from different institutions in Switzerland to evaluate whether a collaboration with GeoCASe would be a good solution to aggregate geoscience data from collections housed in Switzerland. In parallel, SwissCollNet is also examining the possibility to integrate palaeontology data into the Swiss node of GBIF. The minimal goal of SwissCollNet for Earth science data is to achieve standardised registration of geoscience data in Switzerland until 2024 to set up a common process future aggregation of these data.

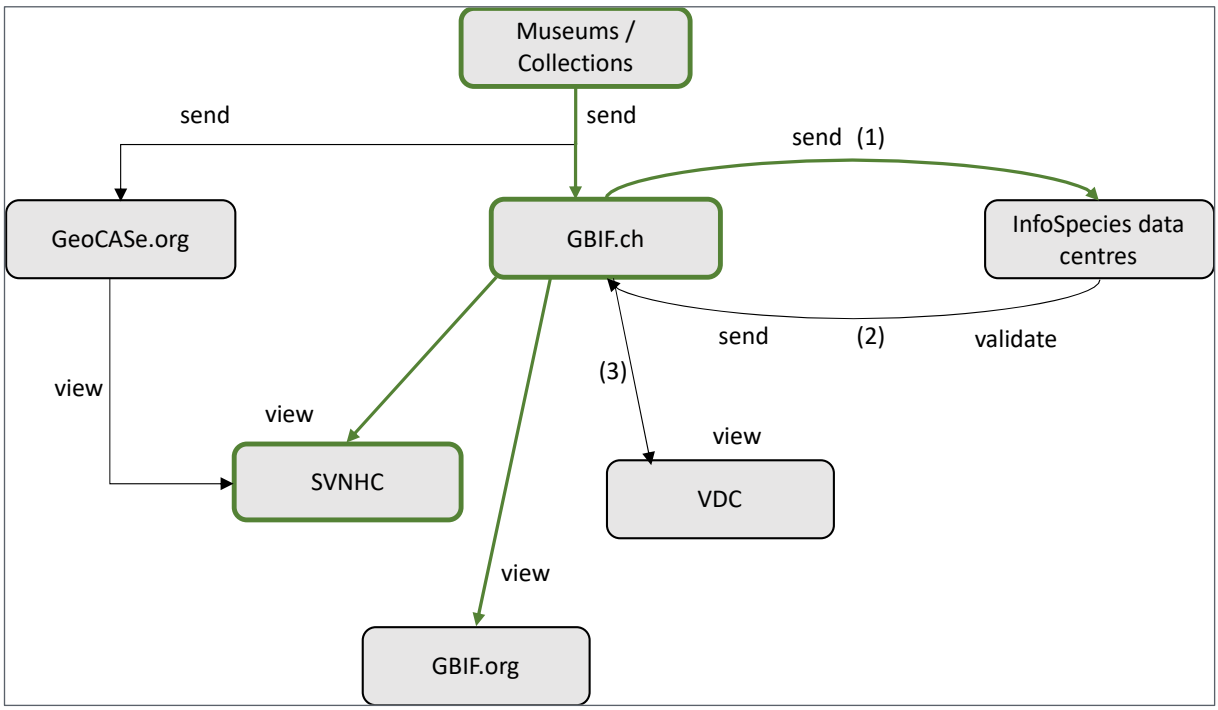

Figure 6: First draft for the architecture of the National Data Aggregator/SVNHC, showing data flow and publication of natural history collection data in the national and international context (i.e., biological and Earth science collection data). The parts which will be carried out in collaboration with InfoSpecies are drawn in green (VDC: Virtual Data Center, SVNHC: Swiss Virtual Natural History Collection).

7.3. Network development, training and communication

With 68 projects started in numerous collection-holding institutions all over Switzerland and the existence of multiple collaborations, the natural history collection network is very active. Digitisation equipment is being shared, expertise and best practices exchanged and many young scientists are trained in the framework of the projects. SwissCollNet organises workshops to give the community a platform for the exchange of know-how and knowledge. Additionally, many more interactions between curators and observational biologists are taking place, due to the close collaboration of SwissCollNet with InfoSpecies or the connected national data centres

for specific organisms. Also, the network is being expanded internationally with close contacts to GeoCASe, CETAF, DiSSCo and GBIF.org.

The communication channels established in the first two years will be maintained. As soon as first results of projects conducted in the collections will be available, communication will also be expanded to media such as daily newspapers, radio and television.

In regard to the Strategy 'Education in Species Knowledge' (Bildung Artenkenntnisse), collaboration with the Platform Biology of SCNAT will be continued.

7.4. National Strategy for Natural History Collections in Switzerland 2025-2035

The National Strategy for Natural History Collections in Switzerland 2025-2035 will be further developed after the workshop held in January 2023. By the end of 2024, a national strategy for natural history collections will be finalized and ready to serve as a role model for designing the collection strategies of the individual institutions. As the set-up of the strategy follows a bottom-up approach, it is expected that it will be largely implemented throughout Switzerland. Along with applying internationally standardised vocabularies and identifiers for specimen data and the development of a common access to natural history collection data hosted in Switzerland, the national strategy for natural history collections will develop and progress, creating added values for owners and consumers of this precious information. Collaborating with the data centers for species information InfoSpecies to share information at species level will also have a big impact on the implementation of the Swiss Biodiversity Strategy and Action Plan that has been elaborated by the Federal Office of the Environment FOEN.

7.5. International participation in DiSSCo

SwissCollNet will pursue the goal to have Switzerland as an official member of DiSSCo at the time it becomes an operational ERIC infrastructure in 2025. With Musnatcoll being part of the preparation of the initiative and with Ana Casino, CSO Deputy Director of DiSSCo also a member of the Steering Board of SwissCollNet, the Swiss natural history collection community has established first connections to this extraordinarily important European initiative.

8. Outlook 2025 – 2028

8.1. Starting Point

In order to shape the future of SwissCollNet and the SVNHC, respectively, it is important to briefly reflect on the transformative change that has taken place since the launch of SwissCollNet in early 2021. Before the launch of SwissCollNet, natural history collection institutions were mostly only loosely connected (**Figure 7**), efforts to digitize collections were mainly done at the level of the institutions themselves, there was little skills sharing or knowledge transfer, there was no overall consensus on data standards and little in the way of established pipelines for data transfer aggregators or for stakeholders to centrally obtain access to mobilised specimen data across taxonomic groups. Knowledge about the domains and whereabouts of the various natural history collections was sparse and scattered. The awareness of their importance was very unevenly developed especially among their governing bodies on the cantonal or municipal level.

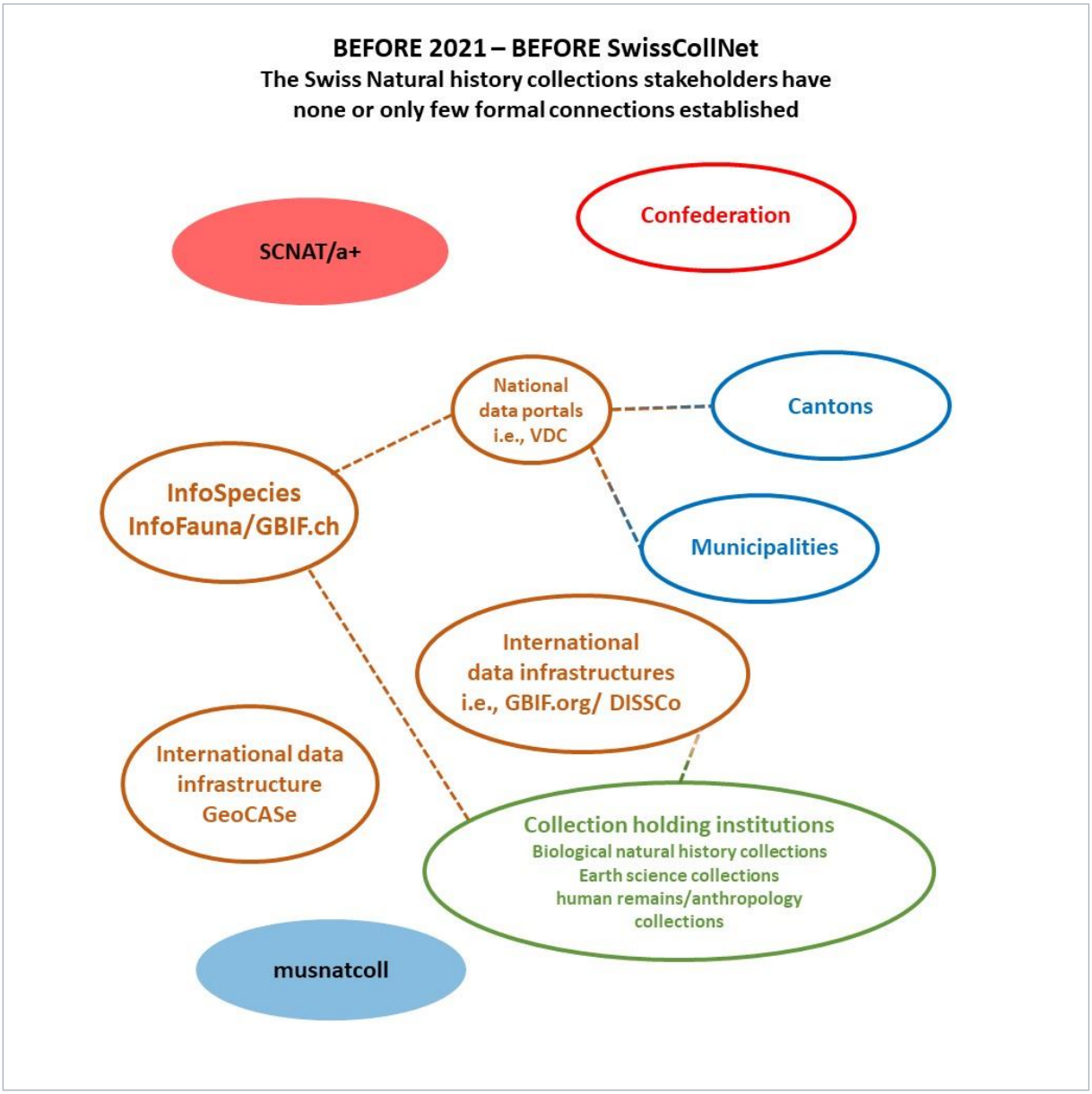

Figure 7: SwissCollNet, before 2021: Natural history collections and their stakeholders in the national and international context. Only a few formal connections were established.

After two years of development and implementation work, a structure crystalizes that shows who is working together and how the various stakeholder benefit from each other (**Figure 8**). Based on this structure, the future models and tools for the long-term operation of SwissCollNet and the SVNHC can be developed (chapter 8.2 ff).

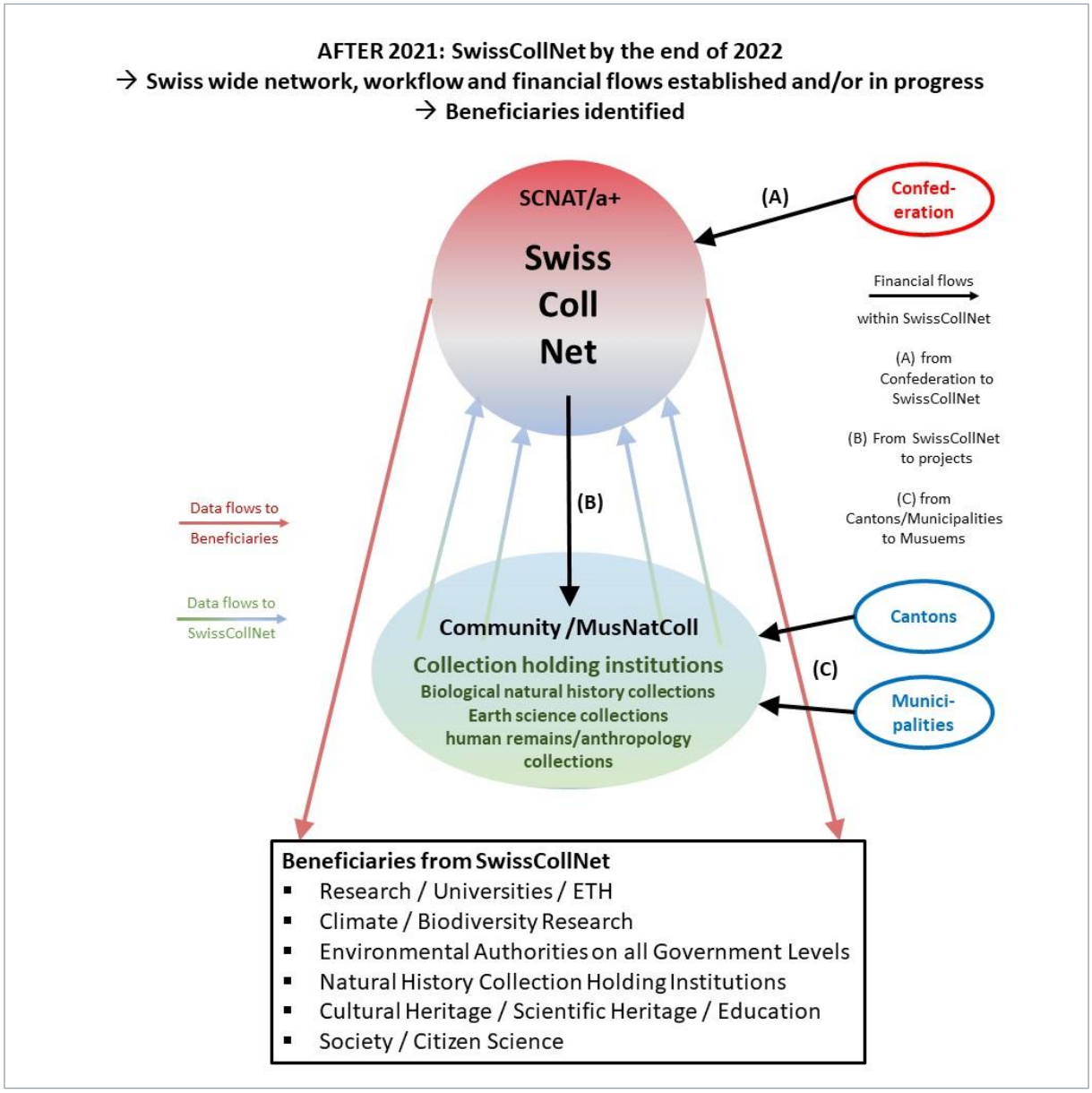

Figure 8: After two years SwissCollNet operations a Swiss wide collaborative network of natural history collections holding institutions has been established. The arrows show the valid data and financial flows for the period of 2021-24. Within this scheme, a wide variety of beneficiaries profit from the outcomes of SwissCollNet, ranging from national and international research communities to society.

8.2. Operational structure of SwissCollNet and the Swiss Virtual Natural History Collection SVNHC

The investments for the construction phase of SwissCollNet 2021-2024 enable the establishment of a sound and sustainable network of invaluable knowledge on natural history collections throughout Switzerland. With the projects running in the individual collections, the first step towards the enhancement of collections and mobilisation of digital information on natural history specimens is achieved. In parallel, investments at the level of data aggregation have been undertaken in order to grant digital access to specimen information on specimens of bio- and geosciences as well as anthropological data. As a result of these achievements, the collections housed in Switzerland will gain national and international visibility.

The outcomes of SwissCollNet can be summarised as follows:

- Sound and sustainable network of knowledge and competences on the collections held in Swiss institutions.
- Strong collaborative network of natural history collection institutions and collaborators.
- National solution for standardised databasing and aggregation of specimen information in the geosciences.
- National solution for standardised databasing and aggregation of specimen information in the biosciences.
- Linkage of specimen information from collections and observation data in biosciences.
- Accessibility of specimen information of collections curated in Switzerland from bio- and geosciences as well as anthropological data for all institutions that hold natural history collections, research and teaching institutions and governmental authorities within Switzerland through the SVNHC online-portal.
- Automatised publishing of information aggregated in Switzerland in relevant international data portals.
- National strategy for natural history institutions.

In order to secure the long-term functioning and expansion of the data aggregators for collection information in bio- and geosciences and the display of information in the SVNHC, an **umbrella association** has to be established that will be responsible:

a) for the planning, development and future direction of collection data aggregation and publication at the Swiss node of GBIF for display in the SVNHC and the international data portals (GBIF.org, DiSSCo etc.) and

b) for the development and future direction of geoscience collection data aggregation in collaboration with GeoCASe.

The umbrella association to be founded for the SVNHC has to be run with a national view and relationship to the national and international scientific community, as well as regional and local views. It needs to be close to the collections and collection holding institutions. Ideally, a close collaboration between SCNAT and Musnatcoll as the **Central Operational Unit** should be implemented, brokering all interactions of the stakeholders, including financial and data flows.

The possible future structure of the umbrella association for the SVNHC will include as members specialist groups of the various InfoSpeciea data centres and representatives of natural history collections. The long-term goal of the organisation is to provide the know-how and tools that natural history collections need for the digitisation, data management, exchange and presentation of their collection objects and data. It also promotes the standardisation of data exchange by jointly defining data standards by the specialist groups and declaring them binding for exchange. In addition to exchange formats, «controlled vocabularies» are also compiled and maintained. It provides a platform through which knowledge, methods and tools can be exchanged, thus reducing redundancies and methodological dead ends. Ideas are collected and disseminated through regular training events. Training activities and the support for future collection concepts will be supported. The umbrella association provides a portal for data exchange and general tools via the SVNHC infrastructure, where bio- and geoscience data are displayed following the FAIR principles. Furthermore, concepts are being developed on how to integrate anthropological data without compromising data protection regulations. The umbrella association will be coordinated and administratively supported by the Central Operational Unit. Development and running of the IT-infrastructures will be carried out within the corresponding institutional structures (GBIF.ch for biology data aggregation, GeoCASe for geoscience data aggregation). The IT infrastructures provide central entry points for bioscience and geoscience data respectively of the natural history collections and exit points to the online-portal SVNHC and other suitable national and international data nodes such as InfoSpecies and the Virtual Data Center (VDC) and GBIF.org.

The natural history collection holding institutions will provide and update specimen data of their collections in a regular and automatised process to the data aggregators run by InfoSpecies, i.e., info fauna / GBIF.ch and

GeoCASe. Registration of specimen data is a daily activity and regular duty of a collection holding institution, but in regard to the overall portfolio of a museum or botanical garden represents only one of the many museum tasks – and the financial shares for digitisation are very limited. Thus, without additional financial resources, the digitisation process is a big endeavor and will take a long time, especially for institutions housing large collections.

8.3. Future funding models for the operational structures

The SVNHC represents a **crucial national infrastructure for future bio- and geodiversity research, teaching, environmental analysis, planning and decision making** in Switzerland. Furthermore, the SVNHC guarantees reliable data exchange with the international data portals. However, for the time being we lack a long-term funding perspective, involving all the stakeholders to take care of this national treasure of knowledge that is being built up by SwissCollNet.

Equally important is the understanding that **SwissCollNet must operate on two levels.** On the one hand, the design, implementation and long-term operation of the National Data Aggregator SVNHC must be secured. On the other hand, it is crucial that the individual collection holding institutions are supported in their work on the collections and in maintaining the collections for current and future generations. For both a strong agreement must be established among all governmental levels in Switzerland as well as possible third-party funders. **Consequently, a multitude of stakeholders must be involved in building a future funding model.**

8.3.1. Various possible funding sources

The operational structures involved in the development and maintenance of the collection network and digital access to collection data require individual service level agreements (Leistungsvereinbarungen) with the municipal, cantonal, national and international levels. Collection holding institutions are mostly financed by the cantons, some by the municipalities, but also by federal funds, for instance collections housed in institutions of higher education. The **Swiss node of GBIF** is financed through a mandate of the **FOEN** and **GeoCASe** is running on in-kind funds from member institutions of CETAF. To keep these operational structures running and interacting, a long-term funding model has to be established, which involves authorities at the municipal, cantonal and federal level.

Furthermore, the possibilities in the private sector need to be explored, i.e., private-public partnerships, crowd funding or even charging for services in the field of data analysis. Within the latter, the mere provision of data should not be charged for as it would contradict the FAIR data principles and break with the well-established practice of exchanging data for free within the scientific community worldwide as well as policies on open access and open science.

The umbrella association to be founded for the SVNHC has to be run with a national perspective and based on a strong relationship with the national and international scientific community, as well as from regional and local viewpoints based on close collaboration with the collection institutions. An ideal functioning would be a collaboration between SCNAT and Musnatcoll, with them acting as the Central Operational Unit coordinating the goals and interactions of the network.

At present the costs for the maintenance and further development of the National Data Aggregator for bioscience data are **partially covered by the FOEN in the framework of the GBIF.ch mandate to info fauna**. This mandate may have to be financially expanded with the increase of data to be handled that originates from collections. Not covered so far, is the integration and aggregation of geoscience data as well as anthropological data.

If the digitisation process has to be enhanced in the collections, additional funds are needed to be either invested directly in the collections or to be distributed in a competitive manner via the umbrella association to the collection holding institutions.

The potential for collaboration with the **Federal Office of Culture** (FOC) has not yet been fully explored. Natural history collections tend to get caught-up between disciplines. The FOC classifies these collections as belonging to science, while the SERI tends to classify them as belonging to culture. But for both, this is only half the truth. Beyond doubt is, that natural history collections are part of our cultural heritage. In fact, they represent

nothing less than the missing link between the cultural and the scientific heritage of humanity. Natural history collections count among the oldest collections in the world and mark the beginning of museums, based on the cabinets of wonders created by universal scholars (Universalgelehrte) as early as the 16th and 17th centuries. Their long-term conservation, conditioning and digitising – in brief their making available to the public – is a cultural and scientific must.

8.3.2. Revision and further development of the 'SwissSpecimen-Concept' in the frame of the Biology Roadmap 2029-2032

The SwissCollNet community and its stakeholder did put a lot of hope into the advancement of the project proposal SwissSpecimen. By submitting a first project proposal to the 2025-28 road map call, the Swiss biological research community has clearly manifested future integrative thinking in a **One Health concept** that was judged as particularly important. SwissSpecimen aims at making Swiss biobanks and natural history collections accessible to science and society.

Hence, the further development of the SwissSpecimen concept will be an important steppingstone in the establishment of a national research infrastructure dedicated to biological specimens, the SVNHC, and consequently in the strengthening of the Swiss research landscape. Implementing SwissSpecimen would result in a win-win situation for both SwissCollNet and the Swiss Biobanking Platform. The research community will therefore pursue this track in a first step with their participation in the round table discussions organised by the Platform Biology of SCNAT and the integration of the proposed infrastructure into the Biology Roadmap 2029-2032.

The SwissSpecimen infrastructure concept is designed to bring together SwissCollNet with the Swiss Biobanking Platform (SBP). It would unite natural history collections and biobanks, but also living collections at a national level. The obtained results (governance, SVNHC, network and expertise etc.) of SwissCollNet are the basis for the natural history collection part of the project. With the realisation of SwissSpecimen, Switzerland would ensure the long-term sustainability of the SVNHC and the national network of natural history collections. Although it did not recommend funding of the proposal to the SERI, the Swiss National Science Foundation recognised the high significance of SwissSpecimen for nature conservation and for the better understanding of the effects of environmental changes, one health, ecological diversion and depletion, antibiotic resistance, evolution, and many additional subjects. The anticipated infrastructure was also rated as state-of-the-art in research and development with a high potential to scientifically modernise museum collections and transform digital access to specimen and genomic/proteomic information resulting in a tremendous number of collaborations within the biological research community and more importantly with other scientific communities that would benefit from access to data and specimens. The One Health concept is particularly important and gives the project added-value.

9. Future legal and funding preconditions

With the Swiss Virtual Natural History Collection becoming a reality for Switzerland, it is now time for the natural history collections holding institutions, politicians and all other stakeholders to establish the ways and means to sustain this activity, creating a shared vision supported by a legal as well as financial road-map.

However, the legal basis on the federal level is weak so far. Only archaeological data are regulated by the «Schweizerisches Zivilgesetzbuch» (Art 724[1]). Neither the national «Kulturförderungsgesetz[2]» nor the national «Museumsgesetz[3]» mention natural history collections. Nevertheless, the «Kulturgüterschutzgesetz[4]» and its decree («Verordnung») and inventories foresee natural history collections among the collection types of category A that need to be protected in case of natural catastrophes or armed conflicts.

[1] SR 210 Schweizerisches Zivilgesetzbuch, Art. 724: Herrenlose Naturkörper oder Altertümer von wissenschaftlichem Wert sind Eigentum des Kantons, in dessen Gebiet sie gefunden worden sind.
[2] Bundesgesetz über die Kulturförderung (Kulturförderungsgesetz, KFG)
[3] Bundesgesetz über die Museen und Sammlungen des Bundes (Museums- und Sammlungsgesetz, MSG) vom 12. Juni 2009
[4] Bundesgesetz über den Schutz der Kulturgüter bei bewaffneten Konflikten, bei Katastrophen und in Notlagen (KGSG)

On the cantonal and municipal levels, the legal regulations vary considerably. In most cases, the cantonal laws on the promotion of culture regulate the ownership and operation of their museums.

In the long term, this **legal shortcoming on the federal level must be closed** so that natural history collections can benefit from federal support in accordance with their value for research and society. The fundamental review of the natural history collections by **SwissCollnet has created the basis for addressing this legal gap**. Hence, concepts for doing so will be developed during the second half of the project.

10. Preliminary Conclusions

Enhancing and modernising the integration of natural history collection data within the already existing infrastructures of InfoSpecies and GeoCASe, as well as connecting information derived on and from specimens in collections with information of species observation **is the most realistic and straightforward approach to reach the goal of setting up the SVNHC**. This approach will promote the availability of information that is essential for us to understand societal and environmental endeavors, for instance climate change mitigation, biodiversity loss reduction and many more challenges. The information provided by the millions of biological and geological specimens housed in Switzerland, and abroad, will contribute to understanding, explaining and reacting to processes taking place today and in the future.

At present, business cases are developed to form a national platform for the natural history collection network, resulting in an umbrella organisation to

(a) develop data models and the data infrastructure,

(b) enhance ongoing conditioning and digitisation of collections and specimens,

(c) intensify the exchange between existing experts as well as the recruiting of new experts for different groups of taxons,

(d) further deepen the international connections.

Furthermore, special consideration is given to the fact, that **natural history collections are often caught between chairs and benches** – or between disciplines respectively. **Cultural funding assigns them to science, science to culture.** As a result, no one from the authorities' side feels responsible for these collections. Therefore, one of the core tasks of SwissCollNet is to raise awareness of this balancing act, to find ways out of the dilemma and to involve both cultural funding and science funding in the handling of these collections. In October 2022, the Federal Office of Culture launched an initiative on provenance research regarding museum collections. Primarily, this relates to objects in archaeology, ethnography and art. But especially old natural history collections go back to mostly colonial trade relations. According to today's standards, this would violate the FAIR principle and almost certainly also the CITES agreement on the trade and exchange of (endangered) species. It is therefore necessary to establish cooperations with various federal offices in order to do justice to natural history collections throughout Switzerland as well as to the countries of origin of these collections and specimens.

Along with **concepts on how to address the legal gap** for natural history collections on the federal level, **concepts for addressing these collections from both, the cultural and the scientific heritage aspect** will be developed during the second project phase of SwissCollNet 2024.

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12. Glossary

ABCD-EFG	Access to Biological Collection Data
BioCASE	Biological Collection Access Service
BoE	Board of Experts SwissCollNet
CETAF	Consortium of European Taxonomic Facilities
DiSSCo	Distributed System of Scientific Collections
DwC	Darwin Core
ERIC	European Research Infrastructure
FAIR principles	Findability, Accessibility, Interoperability, Reuse of digital assets
FOC	Federal Office for Culture
FOEN	Federal Office for the Environment
GBIF.org	Global Biodiversity Information Facility
GBIF.ch	Swiss Node of GBIF
GeoCASe	Geoscience Collections Access Service
GRSciColl	Global Registry of Scientific Collections
info fauna	Swiss Centre for the Cartography of Fauna
InfoSpecies	Swiss Information Center for Species
Musnatcoll	Verband der naturwissenschaftlichen Museen und Sammlungen der Schweiz und Liechtenstein
SB	Steering Board SwissCollNet
SCNAT	Swiss Academy of Sciences
SERI	State Secretariat for Education, Research and Innovation
SU	Scientific Unit
SVNHC	Swiss Virtual Natural History Collection
SBP	Swiss Biobanking Platform
SSS	Swiss Systematics Society
SwissCollNet	Swiss Natural History Collections Network