Swiss Natural History Collections Network (SwissCollNet)

Annual Report 2022

Swiss Academy of Sciences (SCNAT) · Swiss Natural History Collections Network
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1. Activity report

1.1. Evaluation of the project submissions of the first call for project proposals

A first call for project proposals has been published in September 2021, allowing public institutions with collections to apply for a financial support to digitise part of their collections. The proposals had to follow at least one of three strategic endeavours, namely:

- conditioning of collections, following defined standards, to prepare the specimens for digitisation;
- digitizing (databasing and/or imaging) specimens for their future integration in the SVNHC;
- promoting training for collection management and taxonomic expertise.

The applicants had to be in line with the funding regulations of SwissCollNet and follow the call for proposals 2021 description. A total of 6 MCHF was available for this first round of project applications.

49 project proposals have been submitted by the end of 2021. After a formal check by the Scientific Unit, the proposals were sent to international experts in the field. The experts have evaluated the projects following the evaluation criteria set by SwissCollNet. Every proposal has been evaluated at least by two, in many cases by three international experts. Thereafter, the Steering Board of SwissCollNet has analysed and discussed the proposals by taking into account the reports of the international experts and allocated funds of a total of 5'861'138 CHF to 44 projects; these funds are matched by the institutions of the grantees with a total of 6'396'638 CHF.

1.2. Launch and evaluation of a second call for project proposals

In April 2022, the Steering Board and the Board of Expert have met and discussed needs of adaptation of the content and conditions to apply for additional projects in the frame of SwissCollNet. The call for proposals 2022 descriptions were only slightly changed and the main endeavours remained unchanged. For this call, a total of 3'550'000 CHF was available. 25 projects were submitted and evaluated following the same procedures as for the first call for project proposals. The projects all met the evaluation criteria and were granted with a total sum of 3'0120848 CHF and matched by the grantees with 3'351'965 CHF matching funds. One of the projects represents the follow up of a project granted only partly in the first round. Thus, all together, SwissCollNet is funding 68 individual projects. The total amount of funds from SwissCollNet is 8'873'986 CHF, matched by funds from the collection holding institutions with a total of own/in-kind contributions of 9'748'603 CHF (**Appendix I**).

1.3. Individual projects in collections in Switzerland

By the end of 2022, 44 projects were started and 24 projects were about to start. Out of the 68 projects financed, 27 are projects taking place in a single institution and 41 projects are collaboration projects between at least two institutions (**Figure 1**). 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, 2**).

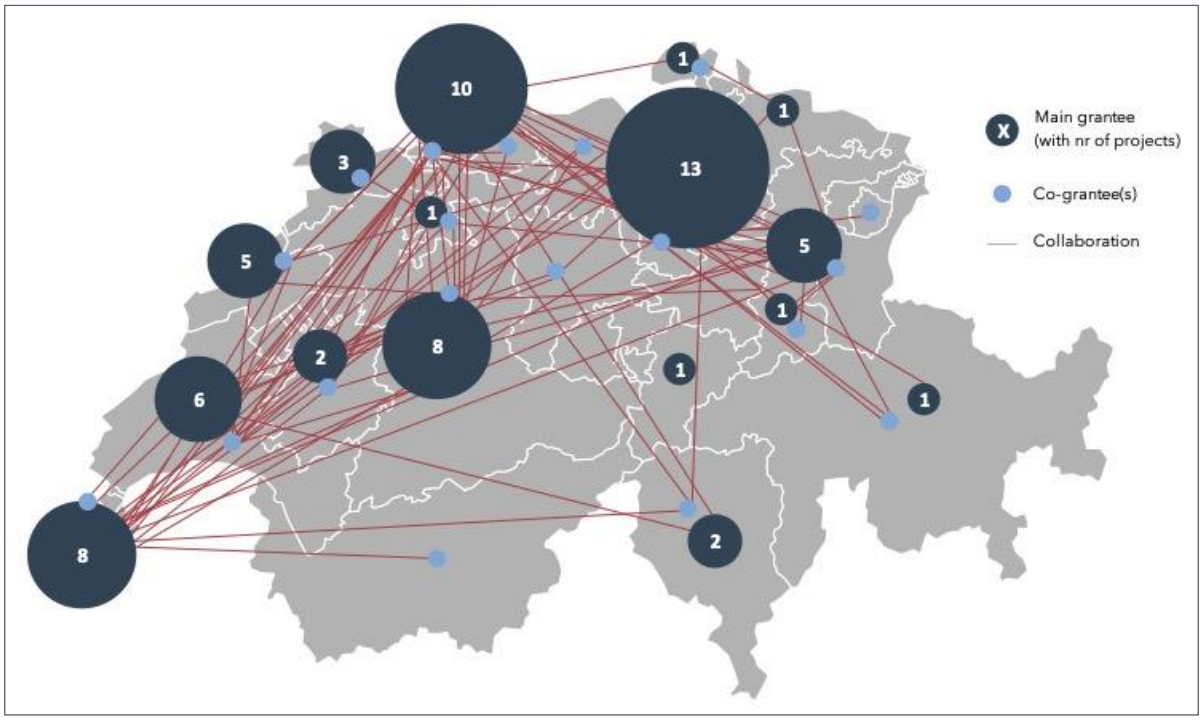

Figure 1: Distribution and collaborations within the 68 projects. Main-grantees (dark blue) and co-grantees (light blue) represent 115 persons located in 53 institutions and 21 cantons of Switzerland. Joint projects are marked with red lines and only reflect collaborations between main-and co-grantees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

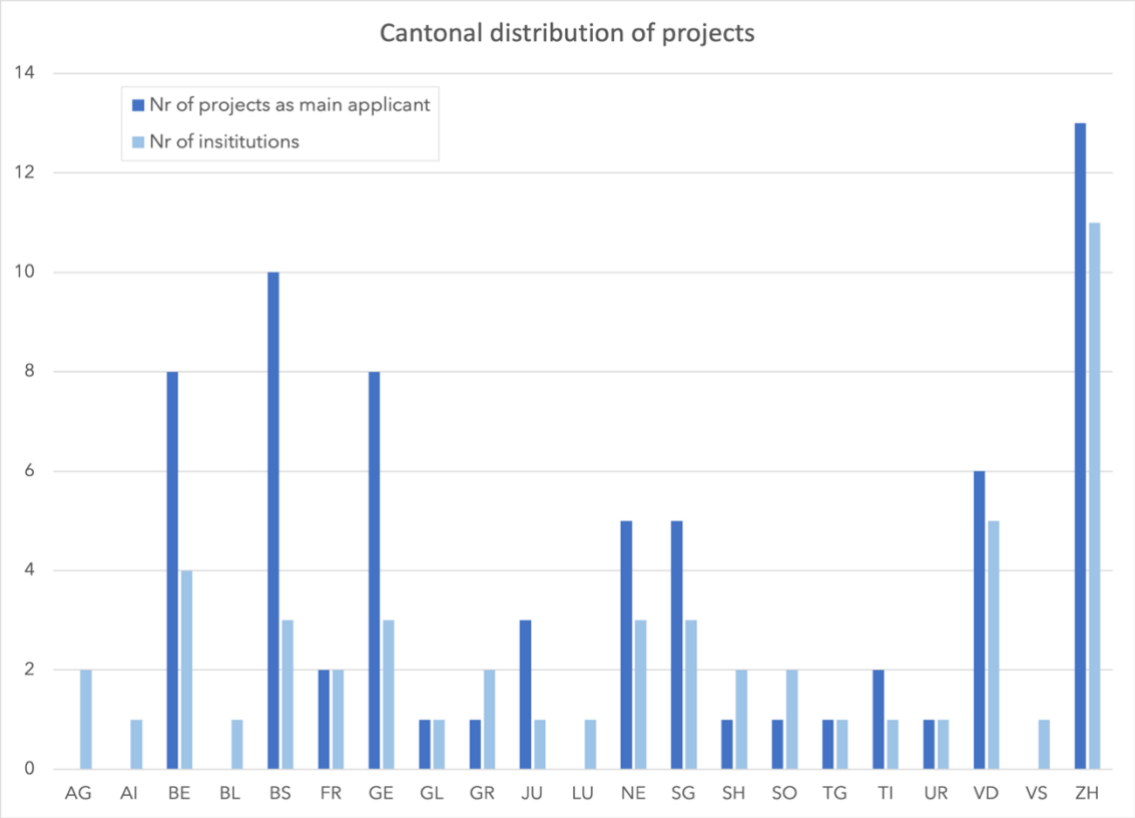

Figure 2: Projects that will be performed in the collection holding institutions are widely distributed. 53 institutions located in 21 cantons are participating in the projects. The cantons which are not listed are cantons with few or no public institutions responsible for natural history collections.

The projects, which last up to two years, cover a wide range of thematically diverse collections from botany, mycology and zoology to palaeontology, geology or anthropology. Most of the objects in the collections are from Switzerland (**Figure 3**).

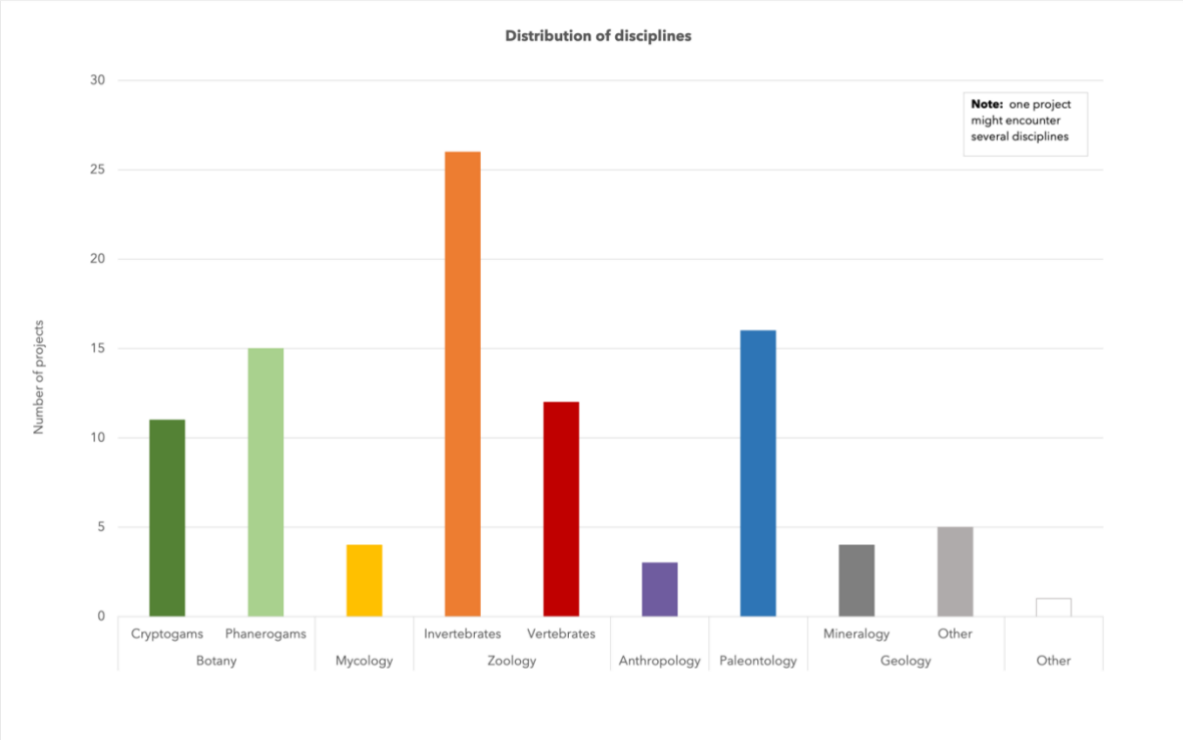

Figure 3: The disciplinary distribution of the projects is wide and reflects to some extent the incidence of the collections.

The botanical projects include collections of cryptogams (algae, diatoms and mosses), of phanerogams (a wide range of orders and families), of entire herbaria, but also historical collections, which date back to the 19th and even back to the 16th-18th century, with the famous collections of Bauhin, Hagenbach, Stähelin, Lachenal and Buxtorf. Furthermore, a few projects focus on lichens and fungi, or on a biobank of plant seeds and DNA.

The biggest number of projects focus on invertebrate collections, such as spiders, insects, worm-like parasites, molluscs and corals, but also vertebrate collections are subject of a few studies.

Also quite numerous are the studies on palaeontological objects, mostly Swiss fossils; plants, dinosaurs, birds, bears, the famous fish collection of Louis Agassiz from 19th century etc.. In other words: **Swiss institutions are prime repositories of holotypes that act as reference objects for the definition of species**. One of the palaeontology projects will digitise more than 10'500 holotypes and reference specimens of fossil vertebrate, invertebrate or single-celled species from 12 institutions.

In geology and mineralogy, the grantees work on digitising type mineral specimens and meteorites. A very significant progress for the entire community will be the integration of geoscience standards into the collection management system Specify.

Considering the strategic endeavours, the focus lays partially on conditioning of collections, following defined standards to prepare the specimens for digitisation. Considerable effort will be made to digitise the collections and make them publicly accessible. **Digitised, the collections provide unique data for climate, biodiversity and landscape research as well as for environmental authorities and educational institutions.** A further goal is to promote training for collection management and taxonomic expertise (**Figure 4**).

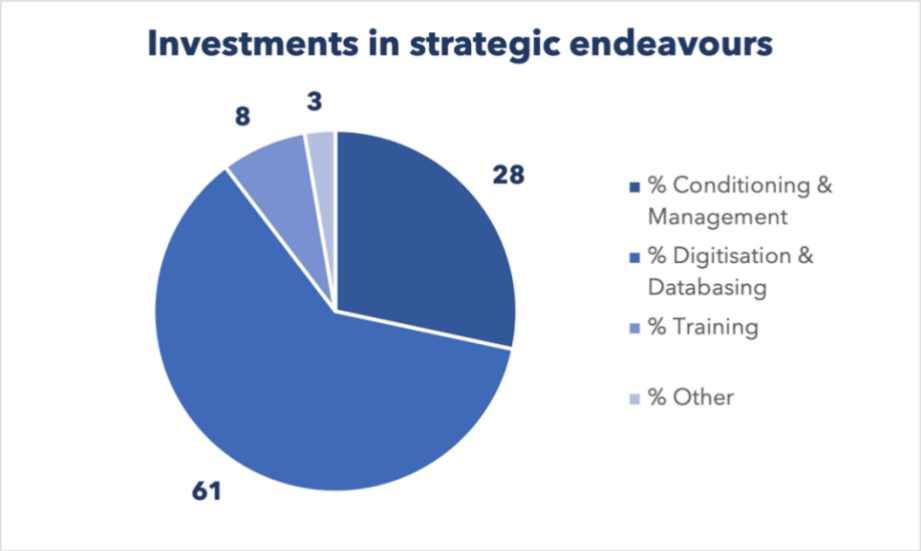

Figure 4: The biggest part of financial contributions from SwissCollNet will flow into the digitisation and databasing of natural history collections, followed by conditioning and managing the collections themselves. A lower amount of funds will be spent directly for training; however, a lot of knowledge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

1.4. First results of individual projects

Grantees of 39 projects of the first call had to report on their activities performed in 2022. The members of the Board of Experts of SwissCollNet have reviewed these reports. They have observed a major challenge for the recruitment of personnel, leading to a later start of many of the projects. In addition, the time needed for the digitization of a single specimen was often underestimated. This was especially the case, when specimens had to be redetermined and prepared for proper conservation. However, none of the projects was judged not to reach the milestones with the funds allocated by the end of the SwissCollNet initiative in 2024. The reports are of high quality and the subjects worked on of big diversity. The different approaches that have been chosen by the grantees to work on the vast diversity of objects will also lead to expanded methodological knowledge, workflows and case studies which might be collected and integrated into an updated version of the 'Handbook on natural history collections management – a collaborative Swiss perspective'.

1.5. Development of a data aggregator and long-term solution for the 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, in 2021, 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 aim at being 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 in July 2022 with representatives of collection holding institutions, researchers and representatives of the different data centres of InfoSpecies, a project and business plan has been worked out to integrate collection data of biosciences and palaeontology into the existing infrastructure run by the Swiss node of GBIF. The general aim as well as the flow of metadata from collection holding institutions to national and international data nodes have been summarized in a concept paper (**Appendix II**). 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 proven to be 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 being 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.

1.6. Survey on natural history collections

In collaboration with GBIF Switzerland, a survey has been worked out to obtain metadata on natural history collections hosted in public institutions in Switzerland. The survey is an expansion of a survey that was conducted in 2018. All institutions which had handed in metadata in 2018 have been asked to expand and update their data. In addition, institutions applying for a project supported by SwissCollNet had to submit the collection survey at least for the specimens, which are subject of the project. In total, 113 curators from 43 institutions have handed in metadata of their collections. The survey provides curators a methodological tool to keep an operational overview of their collections. Selected data is published on GRSciColl, the international register of GBIF (core data of the different institutions), the entire information will be synthetised and published on the webpage of SCNAT (complete data of every institution).

Publication of metadata on GRSciColl as well as on the webpage of SwissCollNet requests standardisation of the information provided by the curators. So far, the person responsible for this task at GBIF.ch has been able to standardise and publish metadata of four institutions. However, some information can also be filtered out from a not yet standardised synopsis table of all the data provided by the curators. Compared to 2018, only one institution has filled in the collection survey for the first time, whereas 13 mostly small institutions with a total of roughly 91'000 objects have not provided expanded information about the metadata from 2018. The collections have been divided by the curators in 351units and 867subunits. In addition to information on specimen numbers and the degree of digitisation of the collections, the survey now mirrors a better picture of the taxonomic belonging of the objects and the curational state of the collections. Also, information about collectors and curators has been added.

1.7. Network development and training

It was planned to organise a workshop for collection-holding institutions towards the end of 2022 in order to offer the opportunity to the network to exchange knowledge and experiences. Due to an overlap with the Geoscience meeting, the workshop was postponed to January 2023. The morning sessions were focusing on the management and standardisation of specimen data, whereas in the afternoon, the community was discussing contents of a national collection strategy. The program of the workshop, as well as the presentations have been published on the SwissCollNet webpage.

1.8. National strategy 2025-2035

A national Strategy for natural history collections has been drafted by members of the BoE, based on a questionnaire that was sent to collection-holding institutions. Contents of a national Strategy for natural history collections have also been discussed with the participants of the SwissCollNet Workshop 2023. The draft will be further developed in 2023. The goal is to develop the strategy until the end of the SwissCollNet initiative (2024) together with the collection-holding institutions. Experiences made and achievements obtained from the initiative will be included in the strategy.

1.9. 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.

Nevertheless, 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.

1.10. 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, the Association of Natural History Museums and Collections in Switzerland and Liechtenstein, 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.

2. Financial report

2.1. Budget and expenses

The budget of the SwissCollNet initiative includes federal contributions and contributions from the partner institutions, which have to make up 50% of the entire costs of SwissCollNet. Grantees of individual projects in public institutions will contribute with at least an equal amount of funds (cash/in-kind) to their projects. Contributions of experts participating in projects led by SwissCollNet directly, such as the collection survey, the national strategy for natural history collections, the construction of the SVNHC, education and training etc. are calculated on a fixed rate.

- SwissCollNet Management includes expenses in the Scientific Unit at SCNAT such as salaries, overhead and infrastructure costs, travelling costs of board and SCNAT members as well as material costs of projects carried out by the SwissCollNet boards and the Scientific Unit.
- Transfer for projects in collections are the costs and matching funds for the 68 individual projects of the grantees and co-grantees, which were selected in the two project calls.
- Data infrastructure includes all cost for the construction of a national data aggregator to aggregate and display the data of collection specimens.

The annual financial installement for 2022 from the confederation was 3'240'200 CHF, matching funds were estimated to be 2'957'500 CHF. The budget has been divided in three categories (**Table 1**).

For the category 'SwissCollNet management', 636'100 CHF federal funds and 587'400 CHF matching funds were budgeted.

For the category 'Transfer for projects in collections, 2'300'100 CHF were budgeted for federal funds as well as for matching funds.

For the data infrastructure category, 304'000 CHF federal funds were budgeted. Matching funds were predicted to be much lower (70'000 CHF), as at the time it was not known, if the infrastructure would be developed from scratch, or if a collaboration with InfoSpecies would be established.

Budget SwissCollNet	2022 SCNAT	2022 Matching funds
SwissCollNet Management		
Management, coordination	625'100.00	371'200.00
Workshops and conferences	5'000.00	20'000.00
Collection strategy	2'000.00	120'000.00
Collection survey	4'000.00	32'200.00
Long-term SVNHC		24'000.00
Training experts		20'000.00
Total management	**636'100.00**	**587'400.00**
Transfer for projects in collections		
Total Projects of calls	**2'300'100.00**	**2'300'100.00**
Data infrastructure		
SVNHC data-repository	304'000.00	70'000.00
Total data infrastructure	**304'000.00**	**70'000.00**
Total	**3'240'200.00**	**2'957'500.00**

Table 1: Annual budget 2022, SCNAT represents federal contributions, matching funds represent cash and in-kind contributions of participants of the initiative SwissCollNet.

Expenses of 2022 are summarised for federal contributions as well as for the cash/in-kind contributions (matching funds) provided by the collection-holding institutions and the numerous experts involved in the initiative (**Table 2**).

Total expenses of federal funds in 2022 were 4'644'623.73 CHF, cash/in kind contributions (matching funds) 2'631'732.50 CHF.

For the SwissCollNet Management, 405'694.23 CHF were spent. Matching funds provided by board members, external experts and curators (collection survey) were 767'175 CHF.

For the data infrastructure, 46'560 CHF were spent for the preproject of the SVNHC and development of the project. Matching funds were 81'417.50 CHF.

Items	SCNAT	Items	Matching funds	Yearly contributions (h) 2022	CHF / h
SwissCollNet Management					
Salaries scientific unit	320'022.88	Governance SB	77'355.00	286.5	270
Traveling and meeting expenses experts	3'261.55	Governance BoE	28'000.00	140	200
Travelling and meeting expenses SU	1'134.25	Evaluation projects SB	168'075.00	622.5	270
		External reviewing	253'800.00	940	270
Overhead SCNAT	73'500.00	Collection strategy	0.00	0	200
Whizive project database	7'688.05	Collection survey GBIF	64'005.00	376.5	170
Communication	59.50	Collection survey institutions	165'240.00	972	170
Bank account	28.00	Long-term SVNHC	10'700.00	53.5	200
Total management	**405'694.23**		**767'175.00**	**3'391.00**	
Transfer for projects in collections					
Projects of calls	**4'192'369.50**	Projects of calls	1'783'140.00		
Data infrastructure					
Mandate UAS-GR	46'560.00	SVNHC expert gremia	67'617.50	397.75	170
		SVNHC individual contributions	13'800.00	69	200
Total data infrastructure	**46'560.00**		**81'417.50**	**466.75**	
Total	**4'644'623.73**		**2'631'732.50**	**3'857.75**	

Table 2. Federal expenses and cash/in-kind contributions (matching funds) 2022.

The transfer for projects in collections was 4'192'369.50 CHF (for details consult **Appendix III**). This comprises the transfer of maximal half of the granted amount of the 44 accepted projects of the first call and the 24 accepted projects of the second call. 39 grantees had to report on the activities perfomed and funds spent in their projects in 2022. Expenses and balances for these projects are presented (**Appendix IV**). The total of SwissCollNet funds spent in the individual projects was 1'107'418 CHF, the cash/in-kind contributions (matching funds) for the individual projects were 1'783'140 CHF in 2022 (**Figure 5**). Most funds were invested for personnel costs. Equipment, consumables and various costs were in a smaller range (**Figure 6**).

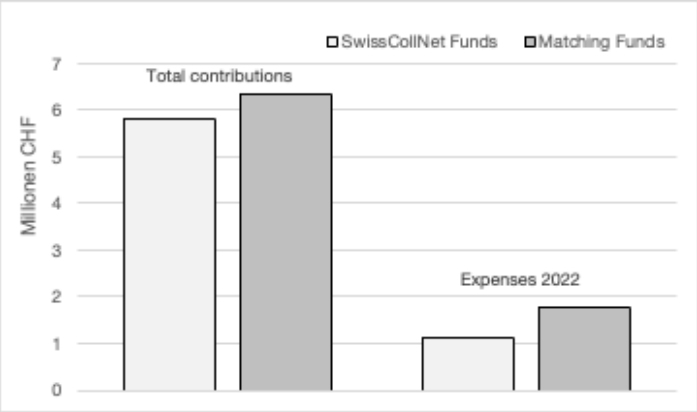

Figure 5. Total contributions and matching funds as well as total expenses of the 39 projects of which the first intermediate reports were due.

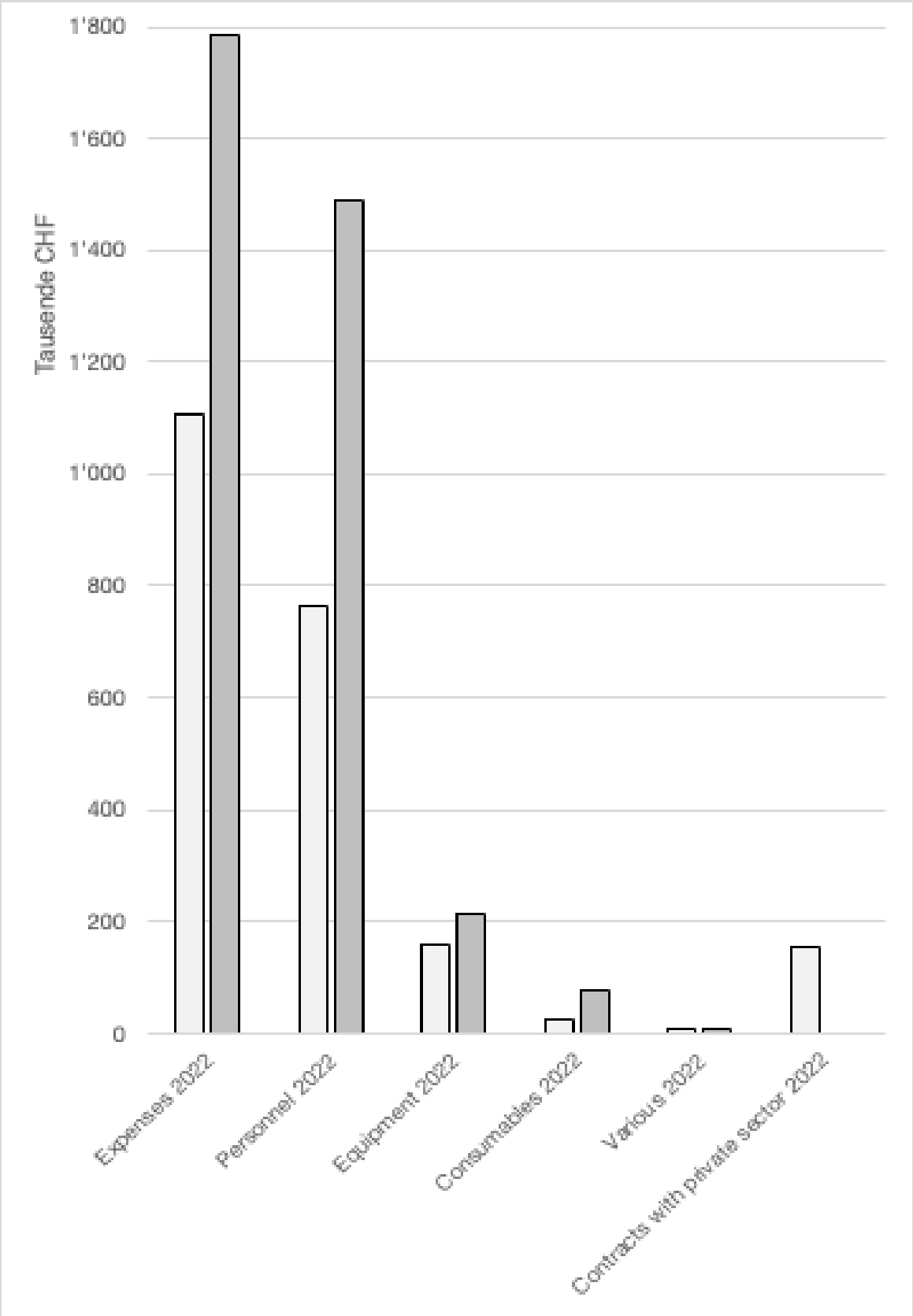

Figure 6. Expenses in 2022 of SwissCollNet funds (bright) and matching funds (dark) divided by categories.

2.2. Balances and cash flow

Expenses of federal funds were compared to the budget established for 2022 (**Table 3**).

The SwissCollNet management category shows a positive balance of 230'405.75 CHF of federal funds. This is partially due to the postponing of projects such as the annual workshop, which has been moved to January 2023. Also, publication cost for the collection survey and the national strategy were not spent, since the projects are not terminated yet. However, the positive balance is predominantly caused by less money spent for salary costs as predicted.

The transfer for projects category shows a negative balance of -1'892'269.50 CHF. This is due to the payment of the first instalment to the grantees of all the 68 projects in 2022, in total 4'192'369.50 CHF (**Appendix III**).

The data infrastructure category shows a positive balance of 257'440 CHF. So far, the costs of this category were limited to the work performed by the University of Applied Sciences Grison.

Items	SCNAT Expenses	SCNAT Budget	SCNAT Balance
SwissCollNet Management			
Management, coordination	405'694.25	625'100.00	219'405.75
Workshops and conferences	0.00	5'000.00	5'000.00
Collection strategy	0.00	2'000.00	2'000.00
Collection survey	0.00	4'000.00	4'000.00
Total management	**405'694.25**	**636'100.00**	**230'405.75**
Transfer for projects in collections			
Projects of calls	**4'192'369.50**	**2'300'100.00**	**-1'892'269.50**
Data infrastructure			
Mandate UAS-GR	46'560.00	44'000.00	-2'560.00
SVNHC	0.00	260'000.00	260'000.00
Total data infrastructure	**46'560.00**	**304'000.00**	**257'440.00**
Total	**4'644'623.75**	**3'240'200.00**	**-1'404'423.75**

Table 3. Balance of federal funds in 2022. The budgeted total amount of money corresponds to the annual instalment of the SERI. Expenses of SwissCollNet are compared to the annual budget of 2022.

In summary, the expenses of federal funds for SwissCollNet in 2022 were 1'404'423.75 CHF higher than budgeted. This negative result is covered by provisions resulting from the positive balance in 2021. On December 31st, 2022, the balance of federal funds was 1'351'792.25 CHF (**Table 4**).

Year	SCNAT Expenses	SCNAT Budget	SCNAT Balance
2021	273'784.00	3'030'000.00	2'756'216.00
2022	4'644'623.75	3'240'200.00	-1'404'423.75
Total	**4'918'407.75**	**6'270'200.00**	**1'351'792.25**

Table 4. Balance of federal funds for the SwissCollNet initiative at the end of the year 2022.

Expenses of cash/in-kind contributions (matching funds) were compared to the budget established for 2022 (**Table 5**).

Matching funds for 2022 were budgeted with 2'957'500 CHF. This sum is composed of matching funds provided by the members of the governance of SwissCollNet (Steering Board and Board of Experts), by external experts for the evaluation of projects, experts involved in the projects carried out by SwissCollNet directly and by cash/in kind contributions by the institutions, which have received a project grant. The total amount of matching funds was 2'631'732.50 CHF in 2022.

The category SwissCollNet management shows a negative balance of 179'775 CHF. Thus, contributions by the SwissCollNet boards and external experts were higher than budgeted. This is due to the evaluation of two calls for projects by 63 international experts and the big workload for the 113 curators to fill in a collection survey.

In the transfer for projects category, the matching funds provided in the individual projects of the collection institutions in 2022 are summarised (for detailed information, consult **Appendix IV**). In total, the participating institutions have contributed with 1'783'140 CHF of cash/in-kind funds to the projects.

The category data infrastructure shows a negative balance of cash/in-kind contributions. In 2022, numerous meetings were carried out with representatives of collection-holding institutions, of InfoSpecies, but also external experts, to shape data models and functionalities of the data infrastructure.

In total, 2'631'732.50 CHF matching funds were invested in 2022, resulting in a difference of 325'767.50 CHF compared to the budget.

Items	2022 Matching funds Expenses	2022 Matching funds Budget	Matching funds Balandce
SwissCollNet Management			
Management, coordination	527'230.00	371'200.00	-156'030.00
Workshops and conferences	0.00	20'000.00	20'000.00
Collection strategy	0.00	120'000.00	120'000.00
Collection survey	229'245.00	32'200.00	-197'045.00
Long-term SVNHC	10'700.00	24'000.00	13'300.00
Training experts	0.00	20'000.00	20'000.00
Total management	**767'175.00**	**587'400.00**	**-179'775.00**
Transfer for projects in collections			
Projects of calls	**1'783'140.00**	**2'300'100.00**	516'960.00
Data infrastructure			
SVNHC data-repository	81'417.50	70'000.00	-11'417.50
Total data infrastructure	**81'417.50**	**70'000.00**	**-11'417.50**
Total	**2'631'732.50**	**2'957'500.00**	**325'767.50**

Table 5. Balance of cash/in-kind contributions (matching funds) in 2022 for the three categories 'SwissCollNet Management', 'Transfer for projects in collections' and 'Data infrastructure'.

In summary, 3'612'724.50 CHF fewer matching funds were provided in the first two years of the SwissCollNet initiative, compared to the budgets for the years 2021 and 2022 (**Table 6**).

Year	Matching Funds Expenses	Matching Funds Budget	Balance
2021	304'243.00	3'591'200.00	3'286'957.00
2022	2'631'732.50	2'957'500.00	325'767.50
Total	**2'935'975.50**	**6'548'700.00**	**3'612'724.50**

Table 6. Balance of cash/in-kind contributions (matching funds) for the SwissCollNet initiative at the end of the year 2022.

The remaining federal funds for the years 2023 and 2024 of the SwissCollNet initiative are 7'431'792.25 CHF. 1'280'721.75 CHF are attributed to the category SwissCollNet management, 5'237'630.50 to the category transfer for projects in collections and 913'440 CHF to the category data infrastructure (**Table 7**).

Year	Items	SCNAT Expenses	SCNAT Budget	SCNAT Balance
2021	SwissCollNet Management	243’784.00	217’000.00	-26’784.00
2022	SwissCollNet Management	405694.25	636’100.00	230’405.75
2023	SwissCollNet Management	0.00	592’100.00	592’100.00
2024	SwissCollNet Management	0.00	485’000.00	485’000.00
Total	**SwissCollNet Management**	**649’478.25**	**1’930’200.00**	**1’280’721.75**
2021	Transfer for projects in collections	0.00	2’717’000.00	2’717’000.00
2022	Transfer for projects in collections	4’192’369.50	2’300’100.00	-1’892’269.50
2023	Transfer for projects in collections	0.00	2’357’900.00	2’357’900.00
2024	Transfer for projects in collections	0.00	2’055’000.00	2’055’000.00
Total	**Transfer for projects in collections**	**4’192’369.50**	**9’430’000.00**	**5’237’630.50**
2021	Data infrastructure	40’000.00	96’000.00	56’000.00
2022	Data infrastructure	46’560.00	304’000.00	257’440.00
2023	Data infrastructure	0.00	300’000.00	300’000.00
2024	Data infrastructure	0.00	300’000.00	300’000.00
Total	**Data infrastructure**	**86’560.00**	**1’000’000.00**	**913’440.00**
Total	**SwissCollNet**	**4’928’407.75**	**12’360’200.00**	**7’431’792.25**

Table 7. Overview of federal funds of the SwissCollNet initiative per year and budget category.

The remaining cash/in-kind contributions (matching funds) to be provided by the participants of the initiative are 10’035’427.50 CHF. In the category SwissCollNet management, CHF 1’204’507 CHF have to be provided until the end of 2024, in the category transfer for projects, at least 5’237’630.50 CHF will be provided and in the category data infrastructure, 913’440 CHF will be provided (**Table 8**).

In conclusion, federal funds spent so far are 4’918’407.75 CHF, matching funds contributed are 2’935’975.50 CHF. The roughly 2 Mio missing matching funds are due to the transfer of project money to all the grantees of the 68 projects, whereas matching funds have been only announced in the intermediate reports of the 39 projects due by the end of the year 2022.

Year	Items	Matching Funds Expenses	Matching Funds Budget	Balance
2021	SwissCollNet Management	251’118.00	804’200.00	553’082.00
2022	SwissCollNet Management	767175	587’400.00	-179’775.00
2023	SwissCollNet Management	0.00	469’600.00	469’600.00
2024	SwissCollNet Management	0.00	361’600.00	361’600.00
Total	**SwissCollNet Management**	**1’018’293.00**	**2’222’800.00**	**1’204’507.00**
2021	Transfer for projects in collections	0.00	2’717’000.00	2’717’000.00
2022	Transfer for projects in collections	1’783’140.00	2’300’100.00	516’960.00
2023	Transfer for projects in collections	0.00	2’357’900.00	2’357’900.00
2024	Transfer for projects in collections	0.00	2’373’603.00	2’373’603.00
Total	**Transfer for projects in collections**	**1’783’140.00**	**9’748’603.00**	**7’965’463.00**
2021	Data infrastructure	53’125.00	70’000.00	16’875.00
2022	Data infrastructure	81’417.50	70’000.00	-11’417.50
2023	Data infrastructure	0.00	699’000.00	699’000.00
2024	Data infrastructure	0.00	161’000.00	161’000.00
Total	**Data infrastructure**	**134’542.50**	**1’000’000.00**	**865’457.50**
Total	**Matching Funds**	**2’935’975.50**	**12’971’403.00**	**10’035’427.50**

Table 8. Overview of cash/in-kind contributions (matching funds) of the SwissCollNet initiative per year and budget category.

3. Synthesis and outlook for activities planned in 2023

In summary, the second year of SwissCollNet was mainly dedicated to the evaluation of two project calls, the establishment of the grant life time management and the start of more than half of the individual granted projects. Also, the project set-up to build a data infrastructure for natural history collection data in collaboration with InfoSpecies was of key importance in 2022. Furthermore, the collection-holding institutions made a big effort in generating metadata of their collections for a national collection inventory (collection survey).

Thus, milestones of 2023 will mainly be the launching of the remaining individual projects in the numerous collection institutions and the development of the collection data infrastructure to aggregate the digital information about collection specimens resulting from the projects (**Figure 7**). In addition, the National Natural History Collection Strategy 2025-2035 will be developed further with the stakeholders. In January 2023, a SwissCollNet workshop was taking place and was a big success for everybody to exchange knowledge and network. This event will be followed with a succeeding workshop in January 2024.

In conclusion, the second year of the SwissCollNet initiative was very satisfactory with many fruitful results representing a strong basis for future activities planned in 2023 and beyond.

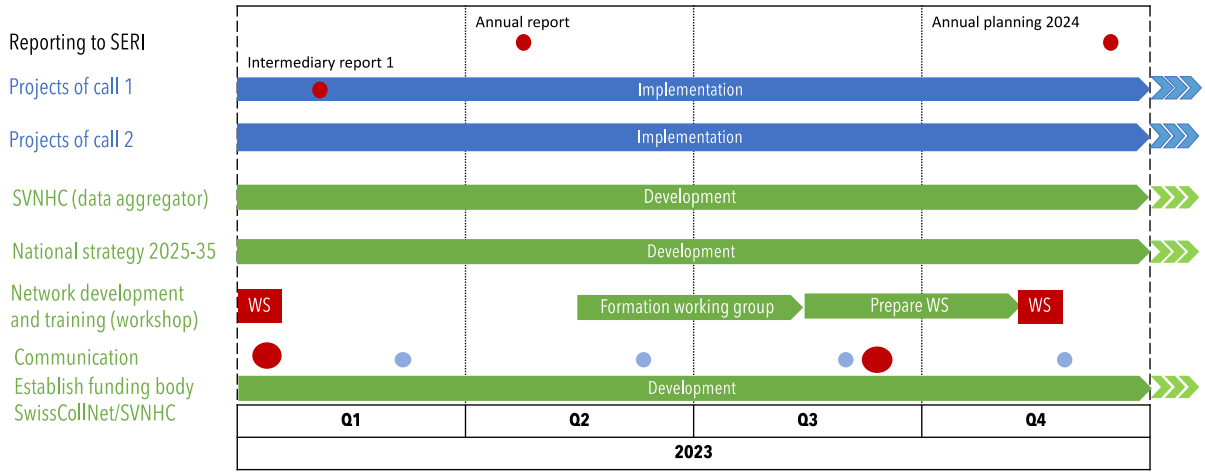

Figure 7: Milestones and projects SwissCollNet 2023. Implementation of the projects supported by SwissCollNet (in blue), will take place in the collection-holding institutions. All other activities (green, red) will be directly steered and coordinated by SwissCollNet.

4. Glossary

BoE	Board of Experts SwissCollNet
CETAF	Consortium of European Taxonomic Facilities
DiSSCo	Distributed System of Scientific Collections
GBIF.org	Global Biodiversity Information Facility
GBIF.ch	Swiss Node of GBIF
GeoCASe	Geoscience Collections Access Service
GRSciColl	Global Registry of Scientific Collections
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
SVNHC	Swiss Virtual Natural History Collection
SwissCollNet	Swiss Natural History Collections Network

5. Appendices

Appendix I

Project Nr	Main grantee	Project title	Start Date	Duration (months)	Disciplines	Co-grantees	Contributions SwissCollNet	Matching funds
SCN101-VD	Freitag Anne	Reconditioning and digitisation of the patrimonial Auguste Forel ant collections in Switzerland, with a focus on the primary types	03.07.22	18	Zoology – Invertebrates	2	107'180	125'792
SCN102-VD	Descombes Patrice	Digitization of the MJBC Rubus herbarium collection	01.09.22	16	Botany – Phanerogams	0	96'000	107'691
SCN103-VD	Gattolliat Jean-Luc	Digitisation, perennation and valorisation of the Mayflies and Stoneflies (Insecta) collections housed in the Swiss institutions	01.07.22	24	Zoology – Invertebrates	3	209'167	301'904
SCN104-VD	Marchant Robin	Upgrade of regional paleontological MGL specimens to the SVNHC standards	01.07.22	24	Geology Paleontology	1	199'609	346'217
SCN105-GE	Cavin Lionel	Rediscovery the collections of a pioneer of Swiss Paleontology: François-Jules Pictet	01.09.22	12	Paleontology	0	45'072	45'072
SCN106-GE	Lionel Monod	Identification and digitization of the unidentified spiders from Switzerland present in the collection of the Natural History Museum of Geneva	01.06.22	10	Zoology – Invertebrates	0	28'000	28'630
SCN108-GE	Blasco Costa Maria Isabel	Digitisation of the types of parasitic helminths described by renown Swiss parasitologists	01.08.22	16	Zoology – Invertebrates	0	74'240	75'500
SCN109-GE	Tardy Emmanuel	Digitization of Delessert's Malacological collection and identification of type specimens (phase 1).	01.09.22	24	Zoology – Invertebrates	0	144'000	146'469
SCN110-GE	Stauffer Fred	Conditioning and open-access of important collections in Geneva and Sion: a joint venture promoting the transfer of collection management policies	01.09.22	24	Botany – Phanerogams	1	355'195	356'888
SCN111-GE	Perret Mathieu	Digitization of the Swiss botanical biobanks for seeds and DNA	01.09.22	24	Botany – Phanerogams Botany – Cryptogams	5	200'000	210'000
SCN112-FR	Girlens Sophie	Reconditioning and digitisation of Hans Pochon's and Nestor Cerutti's Coleoptera collections	02.05.22	24	Zoology – Invertebrates	6	133'562	150'694
SCN113-FR	Kozlowski Gregor	Digitisation of the herbaria of Fribourg (NHMF) and Bern (BERN)	01.09.22	24	Botany – Phanerogams Botany – Cryptogams	3	329'040	331'299
SCN114-NE	MALVESY Thierry	Reactualization and digitization of the fossil fish collection of Louis Agassiz (1807-1873) - Part 2. Uploaded on Wikimedia Commons (Wikimedia CH coll)	01.06.22	14	Paleontology	0	72'816	72'816
SCN115-NE	Bueno Celia	Mollusk and coral collection: About preventive conservation, databasing, revision and data sharing	04.04.22	24	Zoology – Invertebrates	1	177'600	177'600
SCN117-NE	Robert Louise Camille	Vertebrate collection: about preventive conservation and bringing the inventory to the next level	04.04.22	24	Zoology – Vertebrates	0	200'000	200'000
SCN118-JU	Anquetin Jérémy	Digital curation: preserving the world's largest dinosaur track collection	01.07.22	24	Paleontology	0	184'764	191'504
SCN119-BE	Baur Hannes	Pteromalidae in Swiss Collections	01.09.22	18	Zoology – Invertebrates	2	54'750	54'750
SCN120-BE	Menkveld-Gfeller Ursula	Anwil fossil collection, excavation 2014: Identification and digitisation of the material of three museums.	01.09.22	18	Paleontology	5	87'940	89'893
SCN121-BE	Hartwig Stefan T	21st century curation – best practices for expansion and providing accessibility of vertebrate collections	01.07.22	24	Zoology – Vertebrates	2	202'000	204'830
SCN122-BE	Rembold Katja	Rapid digitization of herbarium specimens by conveyor belt	01.05.22	24	Botany – Phanerogams	2	244'663	264'684
SCN123-BS	Frick Holger	Water Mites in Switzerland – conditioning and databasing	01.10.22	18	Zoology – Invertebrates	1	92'440	92'440
SCN124-BS	Borer Matthias	Cholevinae (Coleoptera, Leiodidae) of the world – conditioning, databasing and digitisation	01.09.22	6	Zoology – Invertebrates	0	28'378	28'378
SCN125-BS	Coster Loïc	Digitization of fossil reference objects in natural history collections	01.09.22	24	Paleontology	10	232'280	232'907
SCN126-BS	Zürcher-Pfander Isabelle	The Swiss Auchenorrhyncha collection of Heidi Günthart	01.09.22	12	Zoology – Invertebrates	2	61'161	61'811
SCN127-BS	Christoph Germann	The Termite Collection of Eberhard Ernst	01.09.22	18	Zoology – Invertebrates	0	64'150	66'063
SCN128-BS	Klopfstein Seraina	Campopleginae of Switzerland – time to tackle a major blind spot in biodiversity research	01.06.22	24	Zoology – Invertebrates	3	134'425	151'216
SCN129-BS	de Vos Jurriaan	In the footsteps of Sarasin & Christ: digitizing fern specimens at the herbaria in Basel and Zurich.	01.07.22	18	Botany – Phanerogams Botany – Cryptogams	2	192'600	199'461
SCN130-SO	Schäfer Andreas	Inventory/Digitization of exotic vertebrates in the collection of the Natural History Museum of Solothurn	01.06.22	20	Zoology – Vertebrates	0	32'780	36'200
SCN131-TI	Pollini Paltrinieri Lucia	Spiders (Araneae) of the MCSN: Reconditioning, Revision, Reorganization and Digitization of a Southern Alps collection	01.08.22	16	Zoology – Invertebrates	1	53'000	56'638
SCN132-TI	Koch Bärbel	Increasing accessibility through reorganization and digitization of papered butterflies belonging to the Epstein Collection	02.05.22	24	Zoology – Invertebrates	0	153'000	158'096
SCN133-ZH	Aguirre-Fernandez Gabriel	The Roth collections—from splendid isolation to fossils for all	01.08.22	12	Zoology – Vertebrates Geology Paleontology	2	66'802	73'631
SCN134-ZH	Hofmann Heike	Digital mobilisation and curation of Type specimens in the bryophyte collection of the United Herbaria Zurich Z+ZT	01.07.22	12	Botany – Cryptogams	0	41'760	49'185
SCN135-ZH	Kocyan Alexander	Historical Swiss Plant and Fungi Wet Collections: Rare and Hidden Treasures	01.09.22	18	Botany – Phanerogams Botany – Cryptogams	1	148'787	166'792
SCN138-ZH	Guggisberg Alessia	Digitisation of the entire Gentianaceae collection of the United Herbaria Z+ZT	01.04.22	21	Botany – Phanerogams	1	112'500	112'504
SCN139-ZH	Berndt Reinhard	Digitizing plant-pathogenic fungi in the fungaria Z+ZT and G (Zurich and Geneva)	01.04.22	21	Mycology	1	234'300	234'345
SCN140-ZH	Greeff Michael	Three-dimensional digitization of insect type collections	01.07.22	24	Zoology – Invertebrates	3	434'834	440'164
SCN142-ZH	Scherrer Sandra	Conservation, digital recording and documentation of the historically important palaeontological collection in Winterthur	01.09.22	24	Paleontology	0	197'579	202'424
SCN143-SH	Weibel Urs	Making visible: the reconditioning of the herbaria of Schaffhausen	01.09.22	24	Botany – Phanerogams	0	105'080	103'580
SCN144-TG	Geisser Hannes	Re-determination, revision, databasing, analysis and visualization of four Swiss lichen collections to aid research	01.07.22	18	Botany – Cryptogams	3	54'067	128'980
SCN145-GL	Müller Roland	Digital documentation of the famous Glarus Fossils from the Landesplattenberg Engi	01.06.22	24	Geology Paleontology	6	133'640	151'369
SCN146-SG	Meier Matthias	Meteorites in Institutional and Public Collections of Switzerland	01.07.22	24	Geology Mineralogy	8	108'000	126'098
SCN147-SG	Brülisauer Alfred	Digitisation of Herbarium specimens of the Museums of Natural History in St.Gallen and Winterthur	01.05.22	24	Botany – Phanerogams	1	83'360	85'444
SCN148-SG	Urfer Karin	Hartmann's molluscs. A historical collection that should be shared	01.09.22	15	Zoology – Invertebrates	0	37'800	42'175
SCN149-SG	Pacher Martina	Digitisation of cave bear remains from five cave sites in Eastern Switzerland	01.05.22	24	Zoology – Vertebrates Paleontology	3	130'254	132'331
SCN201-VD	Meisser Nicolas	Perennial conservation and fully digitisation of type minerals specimens of Musée cantonal de géologie, Lausanne	01.01.23	18	Mineralogy	2	162'528	212'495
SCN202-GE	Beck Alexis	Specify CH - Enhancing databasing for Natural History institutions	01.01.23	18	Botany – Phanerogams Botany – Cryptogams Zoology – Vertebrates Zoology – Invertebrates Mycology Paleontology	6	247'415	257'348
SCN203-GE	Price Michelle	Algae Reveal: curation, best practices and data mobilisation	01.03.23	18	Botany – Cryptogams	0	122'450	123'029
SCN204-VD	Gressin Adrien	Developing a new milestone in automated 2D+/3D imaging methodologies for natural history collections	01.01.23	18	Zoology – Vertebrates Zoology – Invertebrates Paleontology Mineralogy	6	168'193	172'376
SCN205-NE	Litman Jessica	Digitization and enhanced visibility of the zoological type collections of Neuchâtel	16.01.23	18	Zoology – Vertebrates Zoology – Invertebrates	1	135'280	136'460
SCN206-NE	Grant Jason	Lichens of the Enlightenment: Reconditioning, digitization, databasing and revision of the lichen collections in Neuchâtel, Lausanne, and Geneva	01.01.23	18	Botany – Cryptogams Mycology	2	260'222	297'644
SCN207-JU	Maridet Olivier	Restoration, revision and inventory of key fossil mammals from Swiss localities of the northeastern tip of the Jura Mountains	01.01.23	18	Paleontology	1	90'200	92'571
SCN208-JU	Becker Damien	From darkness to full light: digitization of an important collection of 19th century herbaria	01.01.23	18	Botany – Phanerogams	0	122'064	127'461
SCN209-BE	Baur Hannes	Curculionoidea of the Natural History Museum Bern	01.03.23	18	Zoology – Invertebrates	0	38'250	38'250
SCN210-BE	Schweizer Manuel	Frozen in time: DNA tissue collections for future biodiversity research	01.01.23	15	Zoology – Vertebrates	2	112'500	119'332
SCN211-BE	Hofmann Beda	Integrating Geoscience Collections into Specify Software	01.03.23	18	Mineralogy Geology – Other	3	272'095	273'988
SCN212-BE	Kropf Christian	Spiders of the Collection Konrad Thaler in the Natural History Museum Bern	01.01.23	18	Zoology – Invertebrates	0	74'250	74'250
SCN213-BS	Frick Holger	Look into your insect drawer – photographing and barcoding 13'000 drawers	01.03.23	9	Zoology – Invertebrates	1	48'100	48'280
SCN214-BS	de Vos Jurriaan	From Bauhin to Lachenal: Enabling digital access to the historic 16th-18th century herbaria in Basel	01.01.23	18	Botany – Phanerogams Botany – Cryptogams	0	87'122	87'310
SCN215-BS	Pichler Sandra	Digital recording of the IAG archaeological human skeletal collection	01.01.23	18	Anthropology	6	149'098	164'538
SCN216-UR	Aschwanden Cassarina	Inventory/Digitization of vertebrates in the collection of the Natural History Museum of Uri	01.12.22	18	Zoology – Vertebrates	0	25'000	25'000
SCN217-GR	Rehsteiner Ueli	Digitising herbaria of the Grisons/Graubünden	01.12.22	18	Botany – Phanerogams	1	109'300	132'300
SCN218-ZH	Kocyan Alexander	Digitalization of Dry Botanical Bulk Collections and Related Herbarium Sheets	01.03.23	15	Botany – Phanerogams Mycology	3	173'282	175'185
SCN219-ZH	Bolliger Thomas	Reappraisal of paleontological objects: (re)determination, labeling and digital inventory	01.02.23	12	Paleontology	0	28'750	29'300
SCN220-ZH	Shaw Colin	Digitisation, database creation and CT scanning for the anthropological collection at the University of Zürich	01.11.22	16	Zoology – Vertebrates Anthropology Paleontology	0	141'571	279'982
SCN221-ZH	Haeusler Martin	Development and Implementation of a Database for the Human Remains Collection of the Institute of Evolutionary Medicine of the University of Zurich	01.03.23	18	Zoology – Vertebrates Anthropology Paleontology Other	0	95'553	117'463
SCN222-ZH	Guggisberg Alessia	Inventory and partial digitisation of Meister diatom collection	01.02.23	18	Botany – Cryptogams	0	57'000	64'950
SCN224-ZH	Schnumenberger Sabrina	Documentation and digitization of several entomological collections at the Naturmuseum Winterthur	01.02.23	18	Zoology – Invertebrates	1	45'000	51'651
SCN225-SG	Urfer Karin	The precious other half: recovering of the unique and pivotal Hugentobler beetle collection at the Natural History Museum St.Gallen	01.03.23	18	Zoology – Invertebrates	0	30'208	31'275
Total							**8'873'986**	**9'748'603**

Appendix I: Overview of the 68 projects granted by SwissCollNet.

Appendix II

Concept of data aggregation and publication for Swiss natural history collection data

1. Overall goal

The goal of SwissCollNet is to facilitate the access to standardized natural history collection data held in Swiss institutions and data of specimens collected in Switzerland and curated abroad for researchers, data providers, curators, collection-holding institutions and customers from the cantons and the federal administration in Switzerland. An online-portal – the Swiss Virtual Natural History Collection (SVNHC) – will inform on collections curated in Switzerland and containing biological and paleontological specimens and guide the customer to national and international data nodes for more detailed information. In addition, the collections will gain visibility for the public.

The digitally available natural history collection data of Swiss public and non-profit organisations (natural history museums and collections, botanical gardens, institutions of higher education) will be aggregated and interconnected. By complying with the FAIR data principles, adhering to defined international data standards and specified data vocabularies, the interoperability and transfer of data to other national and international research infrastructures will be facilitated. The possibility to integrate data from Swiss natural history collections, e.g. into international initiatives like GBIF and GeoCASe is mandatory.

To maintain and increase accessibility of natural history collection data housed in Switzerland and data of Swiss specimens housed abroad is a goal, which has to be pursued in long-term and has to be carried on after the end of the SwissCollNet initiative, which is lasting form 2021 – 2024. Therefore, a long-term organisation will be set-up as an umbrella association, which will be responsible for the planning, development and future orientation of natural history collection data aggregation and diffusion. 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 idle time. Ideas are collected and disseminated through regular events.

2. Aggregation and publication of biological and palaeontological specimen data

More than 90% of the specimens curated in Switzerland are biological or paleontological. For the aggregation and publication of digital information on these specimens, SwissCollNet will collaborate with InfoSpecies and build on the already existing data infrastructure of the Swiss node of GBIF.

InfoSpecies is the umbrella organisation of the national data centers and coordination offices for species promotion. One of the main goals of InfoSpecies is the provision, management and diffusion of species records, which includes natural history collection data.

The long-term objective is to achieve automatised data transfer of collection data to the national aggregator and publication of data on national and international online portals as well as an automatised update of data records. As a minimal goal, data generated in the frame of the SwissCollNet initiative have to be nationally aggregated and be publicly accessible by the end of the year 2024 through the Swiss node of GBIF.

3. Aggregation and publication of geological and anthropological specimen data

Aggregation of digital information form collections of minerals, rocks, sediments, meteorites and palaeontology, SwissCollNet will collaborate with GeoCASe.

For anthropological/archaeological collections, a decision still has to be taken. Out of the 68 approved projects, 3 projects deal with this type of data and will address the question how they will (can be) represented within SwissCollNet/SVNHC. Of special consideration is hereby the question of data protection.

4. Project concept for biological and palaeontological specimen data

SwissCollNet has worked out a first concept for the collaboration with InfoSpecies, based on a preparatory study performed by the University of Applied Sciences Grison, a workshop with stakeholders of collections, the biodiversity observation community, geosciences etc. and several exchange meetings with persons from InfoSpecies, in particular with info fauna.

4.1. Stakeholders (providers of data, users of data)

4.1.1. Data providers

The main data providers are public and non-profit natural history collection-holding institutions.

The following collections are concerned: preserved specimens in botany (cryptogams, phanerogams), mycology, lychens and zoology (vertebrates, invertebrates), paleontological, archaeozoological and archaeobotanical collections.

The following disciplines are out of scope: microbiology, virology, veterinary medicine, human medicine.

4.1.2. Data users

The data users which were identified are listed below.

- Researchers (national and international levels)
- Data collection-holding institutions
- Swiss Datacenters for Species Information
- National and international research infrastructures
- Citizen scientists
- General public

4.2. Data flow and accessibility of data

The data are openly published and follow the FAIR data principles unless considerations about protection of biodiversity or ethical considerations apply. Some data are sensitive and should not be made available to the general public. Therefore, it must be possible to control the publication of the data on several levels. The sensitivity of the data is determined by the data owner and the InfoSpecies deontology that is applied to Swiss data flowing into GBIF.

The system has to offer the possibility for data providers to easily update their data on their own.

The data aggregator redistributes the data to the Swiss online portal SVNHC and to the international open-source data nodes, like GBIF.org, GeoCASe and the Swiss data centers for species information. Data flow to other national aggregators is possible if it does not conflict with the business model of the respective aggregators. A one-way data flow from the collection holding institutions through the data aggregator to the online portal SVNHC is planned. An automated ticketing system for data users will be installed to give stakeholders the possibility to interact with data providers for data corrections etc.. Updates of the specimen data will only be performed by the data providers (owners of the data).

Data have to be traceable. It must be possible to trace who downloads which data. This information is needed by the collections as an argument for entering projects.

For publication of collection specimen data at the Virtual Data Center (VDC), validation of data by the corresponding data centers for species information has to be carried out. Therefore, collection data information to be published in the VDC will first be transferred to the data centers and be published after validation and adaptation to specific requirements of the data users of the VDC (federal and cantonal administration, eco-offices).

The Swiss online portal SVNHC may be integrated in existing infrastructures like GBIF.ch or GBIF.org.

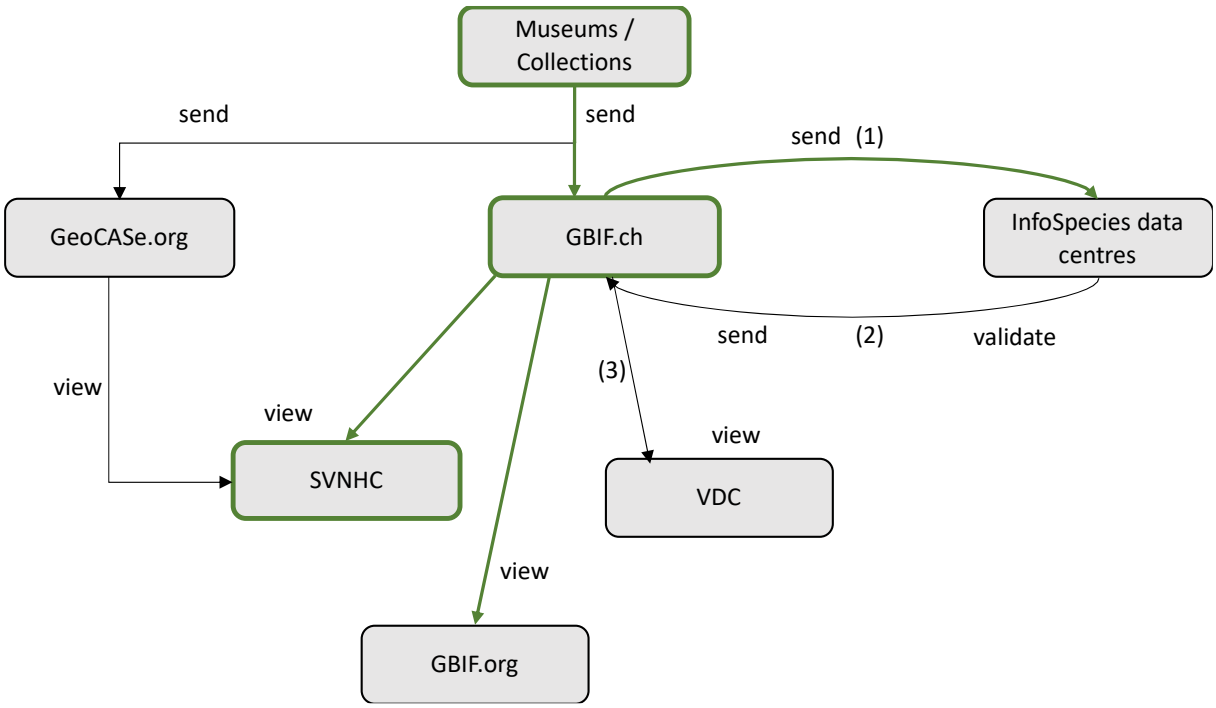

Figure 1: Data flow and publication of natural history collection data (i.e., biological and earth science collection data). The parts which will be carried out in collaboration with InfoSpecies are drawn in green.

4.3. Data structure and validation

4.3.1. **Data structure:**

Whereas GBIF organizes data by the physical location of the finding, more inclusive data models have originated in recent years: DiSSCo developed the Digital Specimen concept and the Biodiversity Collections Network developed the Extended Specimen concept. As the latter two will be taken over by most aggregators in the near future, SwissCollNet will as well implement one of them or a combination of them. The data aggregator should include at least the details as used by GBIF.ch, ideally it should contain the details used in the collection management system SPECIFY.

The data model of SwissCollNet follows standards to guarantee interoperability with upstream data providers and downstream data aggregators. The two currently prevailing standards are Darwin Core and ABCD-EFG, Darwin Core is favored as it is used in the Collection Management System Specify and the aggregator GBIF. Darwin Core should be the main standard, the system may be expanded to ABCD-EFG or have Darwin core covering information of ABCDE-EFG in the future.

Vocabularies used in the aggregator of collection specimen data have to be internationally compatible, open and externally controlled and provide unique identifiers that link to the terms of the vocabularies. As vocabulary, the biodiversity standards of TDWG have to be respected and implemented. In biological species names, for instance, the GBIF Backbone Taxonomy has to be used.

Data sets have to be uniquely identifiable; this also applies to the 'controlled vocabularies. Persistent identifiers have to be used.

4.3.2. **Data validation:**

The data providers are responsible for the correctness and quality of their data. User friendly reporting options should exist for feedback from users to the data providers.

4.4. IT-infrastructure

The IT-infrastructure for natural history specimen data is a standardised database operated by the Swiss node of GBIF. The IT infrastructure provides a central entry and exit point for biological and palaeontological data of the natural history collections. It allows data input via an API access with OAuth2 authentication and automated via a locally installed 'wrapper' e.g. GBIF. It allows automated or manual data output to GBIF.org, the SVNHC-online platform, the Swiss data centers of species information (e.g. info fauna, info flora etc.) and eventually GeoCASe.

The current pipeline which takes care of collection data (GCH-DATA within PICT-IS) is run by info fauna in the frame of the GBIF Swiss Node mandate of the FOEN. It is not automatized and requires some freshen up. This update should allow the biodiversity data community to share and enrich data in an efficient and transparent way while respecting existing commitments (such as the publication of data on GBIF) and guidelines (use and diffusion of data: https://www.infospecies.ch/de/daten/datennutzung.html).

4.5. Data storage and long-term maintenance

In the scope of this project, a data management plan (DMP) will be generated that deals – amongst others – with data storage and long-term maintenance of the collection data in the data aggregator. This DMP will be written by representatives of SCNAT, the SwissCollNet board(s), InfoSpecies and external consultants.

4.6. Milestones

The milestones to be reached in the project are as follows:

a. Project planning:
   Set up of the collaboration between SwissCollNet and InfoSpecies (organisational structure of the project, project milestones and contents, responsibilities, timeline, business plan, risks assessment).

b. Specifications of project contents:
   Expert groups will further specify the requirements needed to fulfil the milestones defined in the project plan structured in work packages.

c. Implementation and development of the data aggregation infrastructure (GBIF/PICTIS) and the SVNHC online portal:

The infrastructure will be developed using an AGILE process.

d. Aggregation and publication of natural history collection data:
Data generated in the frame of the initiative SwissCollNet will be transferred to GBIF.ch and displayed in the SVNHC in 2024 and represent the prototype of the long-term infrastructure.

e. Long-term development of the infrastructure:
To further develop the prototype and keep-up with international developments, representatives of natural history collection institutions have to be part of the executive board of the Swiss node of GBIF and their role and responsibility be integrated into the rules of procedure of GBIF.ch.

Appendix III

Project Nr.	Main grantee	Project Duration	Total Contributions SwissCollNet	First instalment SwissCollNet (2022)	Balance
SCN101-VD	Freitag	18	107'180.00	36'120.00	71'060.00
SCN102-VD	Descombes	16	96'000.00	25'000.00	71'000.00
SCN103-VD	Gattolliat	24	209'167.00	57'047.00	152'120.00
SCN104-VD	Marchant	24	199'609.00	99'804.50	99'804.50
SCN105-GE	Cavin	12	45'072.00	45'072.00	0.00
SCN106-GE	Monod	10	28'000.00	28'000.00	0.00
SCN108-GE	Blasco Costa	16	74'240.00	37'120.00	37'120.00
SCN109-GE	Tardy	24	144'000.00	36'000.00	108'000.00
SCN110-GE	Stauffer	24	355'195.00	117'570.00	237'625.00
SCN111-GE	Perret	24	200'000.00	21'667.00	178'333.00
SCN112-FR	Giriens	24	133'562.00	44'515.00	89'047.00
SCN113-FR	Kozlowski	24	329'040.00	64'090.00	264'950.00
SCN114-NE	Malvesy	14	72'816.00	36'408.00	36'408.00
SCN115-NE	Bueno	24	177'600.00	88'800.00	88'800.00
SCN117-NE	Robert	24	200'000.00	110'655.00	89'345.00
SCN118-JU	Anquetin	24	184'764.00	84'520.00	100'244.00
SCN119-BE	Baur	18	54'750.00	25'000.00	29'750.00
SCN120-BE	Menkveld-Gfeller	18	87'940.00	43'970.00	43'970.00
SCN121-BE	Hertwig	24	202'000.00	101'000.00	101'000.00
SCN122-BE	Rembold	24	244'663.00	226'726.00	17'937.00
SCN123-BS	Frick	18	92'440.00	46'220.00	46'220.00
SCN124-BS	Borer	6	28'378.00	28'378.00	0.00
SCN125-BS	Costeur	24	232'280.00	138'700.00	93'580.00
SCN126-BS	Zürcher-Pfander	12	61'161.00	61'161.00	0.00
SCN127-BS	Germann	18	64'150.00	16'740.00	47'410.00
SCN128-BS	Klopfstein	24	134'425.00	47'275.00	87'150.00
SCN129-BS	de Vos	18	192'600.00	96'300.00	96'300.00
SCN130-SO	Schäfer	20	32'780.00	16'000.00	16'780.00
SCN131-TI	Pollini Paltrinieri	16	53'000.00	25'000.00	28'000.00
SCN132-TI	Koch	24	153'000.00	76'500.00	76'500.00
SCN133-ZH	Aguirre-Fernandez	12	66'802.00	66'802.00	0.00
SCN134-ZH	Hofmann H	12	41'760.00	41'760.00	0.00
SCN135-ZH	Kocyan	18	148'787.00	59'515.00	89'272.00
SCN138-ZH	Guggisberg	21	112'500.00	56'000.00	56'500.00
SCN139-ZH	Berndt Reinhard	21	234'300.00	114'650.00	119'650.00
SCN140-ZH	Greeff	24	434'834.00	217'417.00	217'417.00
SCN142-ZH	Scherrer	24	197'579.00	44'124.00	153'455.00
SCN143-SH	Weibel	24	105'060.00	52'030.00	53'030.00
SCN144-TG	Geisser	18	54'067.00	25'000.00	29'067.00
SCN145-GL	Müller	24	133'640.00	37'112.00	96'528.00
SCN146-SG	Meier	24	108'000.00	36'000.00	72'000.00
SCN147-SG	Brülisauer	24	83'360.00	41'000.00	42'360.00
SCN148-SG	Urfer	15	37'800.00	18'400.00	19'400.00
SCN149-SG	Pacher	24	130'254.00	65'127.00	65'127.00
SCN201-VD	Meisser	18	162'528.00	81'264.00	81'264.00
SCN202-GE	Beck	18	247'415.00	123'707.00	123'708.00
SCN203-GE	Price	18	122'450.00	61'225.00	61'225.00
SCN204-VD	Gressin	18	168'193.00	84'097.00	84'096.00
SCN205-NE	Litman	18	135'280.00	67'640.00	67'640.00
SCN206-NE	Grant	18	260'222.00	130'111.00	130'111.00
SCN207-JU	Maridet	18	90'200.00	45'100.00	45'100.00
SCN208-JU	Becker	18	122'064.00	61'034.00	61'030.00
SCN209-BE	Baur	18	38'250.00	19'125.00	19'125.00
SCN210-BE	Schweizer	15	112'500.00	56'250.00	56'250.00
SCN211-BE	Hofmann	18	272'095.00	136'048.00	136'047.00
SCN212-BE	Kropf	18	74'250.00	37'125.00	37'125.00
SCN213-BS	Frick	9	48'100.00	48'100.00	0.00
SCN214-BS	de Vos	18	87'122.00	43'561.00	43'561.00
SCN215-BS	Pichler	18	149'098.00	74'459.00	74'639.00
SCN216-UR	Aschwanden	18	25'000.00	12'500.00	12'500.00
SCN217-GR	Rehsteiner	18	109'300.00	54'000.00	55'300.00
SCN218-ZH	Kocyan	15	173'282.00	86'641.00	86'641.00
SCN219-ZH	Bolliger	12	28'750.00	28'750.00	0.00
SCN220-ZH	Shaw	16	141'571.00	70'000.00	71'571.00
SCN221-ZH	Haeusler	18	95'553.00	47'777.00	47'776.00
SCN222-ZH	Guggisberg	18	57'000.00	28'500.00	28'500.00
SCN224-ZH	Schnurrenberger	18	45'000.00	22'500.00	22'500.00
SCN225-SG	Urfer	18	30'208.00	16'560.00	13'648.00
Total			**8'873'986.00**	**4'192'369.50**	**4'681'616.50**

Appendix III. Transfer of SwissCollNet funds to grantees in 2022.

Appendix IV

Project Nr.	Main grantee	Project Duration	Total Contributions SwissCollNet	2022 Expenses (SwissCollNet Funds)	Total Matching funds	2022 Matching Funds	Balance SwissCollNet Funds	Balance Matching funds
SCN101-VD	Freitag Anne	18	107'180	34'734	125'792	45'765	72'446	80'027
SCN102-VD	Descombes Patrice	16	96'000	22'465	107'691	32'866	73'535	74'825
SCN103-VD	Gattolliat Jean-Luc	24	209'167	51'283	301'904	76'194	157'884	225'710
SCN104-VD	Marchant Robin	24	199'609	51'027	348'217	84'408	148'582	263'809
SCN105-GE	Cavin Lionel	12	45'072	0	45'072	0	45'072	45'072
SCN106-GE	Lionel Monod	10	28'000	0	28'630	0	28'000	28'630
SCN108-GE	Blasco Costa Maria Isabel	16	74'240	10'668	75'500	47'064	63'572	28'436
SCN109-GE	Tardy Emmanuel	24	144'000	21'953	146'469	30'175	122'047	116'294
SCN110-GE	Stauffer Fred	24	355'195	40'758	356'888	87'834	314'437	269'054
SCN111-GE	Perret Mathieu	24	200'000	17'656	210'000	32'330	182'344	177'670
SCN112-FR	Giriens Sophie	24	133'562	42'617	150'694	53'684	90'945	97'010
SCN113-FR	Kozlowski Gregor	24	329'040	58'629	331'299	75'647	270'411	255'652
SCN114-NE	MALVESY Thierry	14	72'816	13'009	72'816	13'242	59'807	59'574
SCN115-NE	Bueno Celia	24	177'600	27'370	177'600	47'635	150'230	129'965
SCN117-NE	Robert Louise Camille	24	200'000	48'961	200'000	121'354	151'039	78'646
SCN118-JU	Anquetin Jérémy	24	184'764	36'702	191'504	107'069	148'062	84'435
SCN119-BE	Baur Hannes	18	54'750	4'184	54'750	7'578	50'566	47'172
SCN120-BE	Menkveld-Gfeller Ursula	18	87'940	8'266	89'893	35'904	79'674	53'989
SCN121-BE	Hertwig Stefan T	24	202'000	36'687	204'830	49'539	165'313	155'291
SCN122-BE	Rembold Katja	24	244'663	104'703	264'684	94'404	139'960	170'280
SCN123-BS	Frick Holger	15	92'440	15'650	92'440	25'112	76'790	67'328
SCN124-BS	Borer Matthias	6	28'378	0	28'378	0	28'378	28'378
SCN125-BS	Costeur Loïc	24	232'280	95'036	232'607	52'547	137'244	180'060
SCN126-BS	Zürcher-Pfander Isabelle	12	61'161	0	61'811	0	61'161	61'811
SCN127-BS	Christoph Germann	18	64'150	0	66'063	20'029	64'150	46'034
SCN128-BS	Klopfstein Seraina	24	134'425	22'969	151'216	32'600	111'456	118'616
SCN129-BS	de Vos Jurriaan	18	192'600	51'652	199'461	84'377	140'948	115'084
SCN130-SO	Schäfer Andreas	24	32'780	8'940	36'200	12'370	23'840	23'830
SCN131-TI	Pollini Paltrinieri Lucia	19	53'000	4'973	56'638	14'133	48'027	42'505
SCN132-TI	Koch Bärbel	24	153'000	45'875	158'096	51'110	107'125	106'986
SCN133-ZH	Aguirre-Fernandez Gabriel	12	66'802	0	73'631	0	66'802	73'631
SCN134-ZH	Hofmann Heike	12	41'760	0	49'185	0	41'760	49'185
SCN135-ZH	Kocyan Alexander	18	148'787	26'409	166'792	56'395	122'378	110'397
SCN138-ZH	Guggisberg Alessia	21	112'500	5'500	112'504	75'926	107'000	36'578
SCN139-ZH	Berndt Reinhard	21	234'300	49'778	234'345	103'220	184'522	131'125
SCN140-ZH	Greeff Michael	24	434'834	19'679	440'164	53'035	415'155	387'129
SCN142-ZH	Scherrer Sandra	24	197'579	6'871	202'424	30'592	190'708	171'832
SCN143-SH	Weibel Urs	7	105'060	4'565	103'580	28'936	100'495	74'644
SCN144-TG	Geisser Hannes	18	54'067	1'294	128'980	32'775	52'773	96'205
SCN145-GL	Müller Roland	24	133'640	26'085	151'369	30'000	107'555	121'369
SCN146-SG	Meier Matthias	24	108'000	0	126'098	1'767	108'000	124'331
SCN147-SG	Brülisauer Alfred	24	83'360	42'142	85'444	13'393	41'218	72'051
SCN148-SG	Urfer Karin	15	37'800	4'910	42'175	5'601	32'890	36'574
SCN149-SG	Pacher Martina	24	130'254	43'418	132'331	16'530	86'836	115'801
Total			6'078'555	1'107'418	6'616'165	1'783'140	4'971'137	4'833'025

Appendix IV: Balance of SwissCollNet granted funds and matching funds on December 31th, 2022. Projects of the first call for project submissions published in September 2021 are shown. Project SCN140-ZH was granted in the first call with 50% of the requested funds and in the second call with the remaining 50% of the funds after proof of feasibility. Here, the total amount of funds of the two calls is shown, as the two applications have been fused to one single project.