



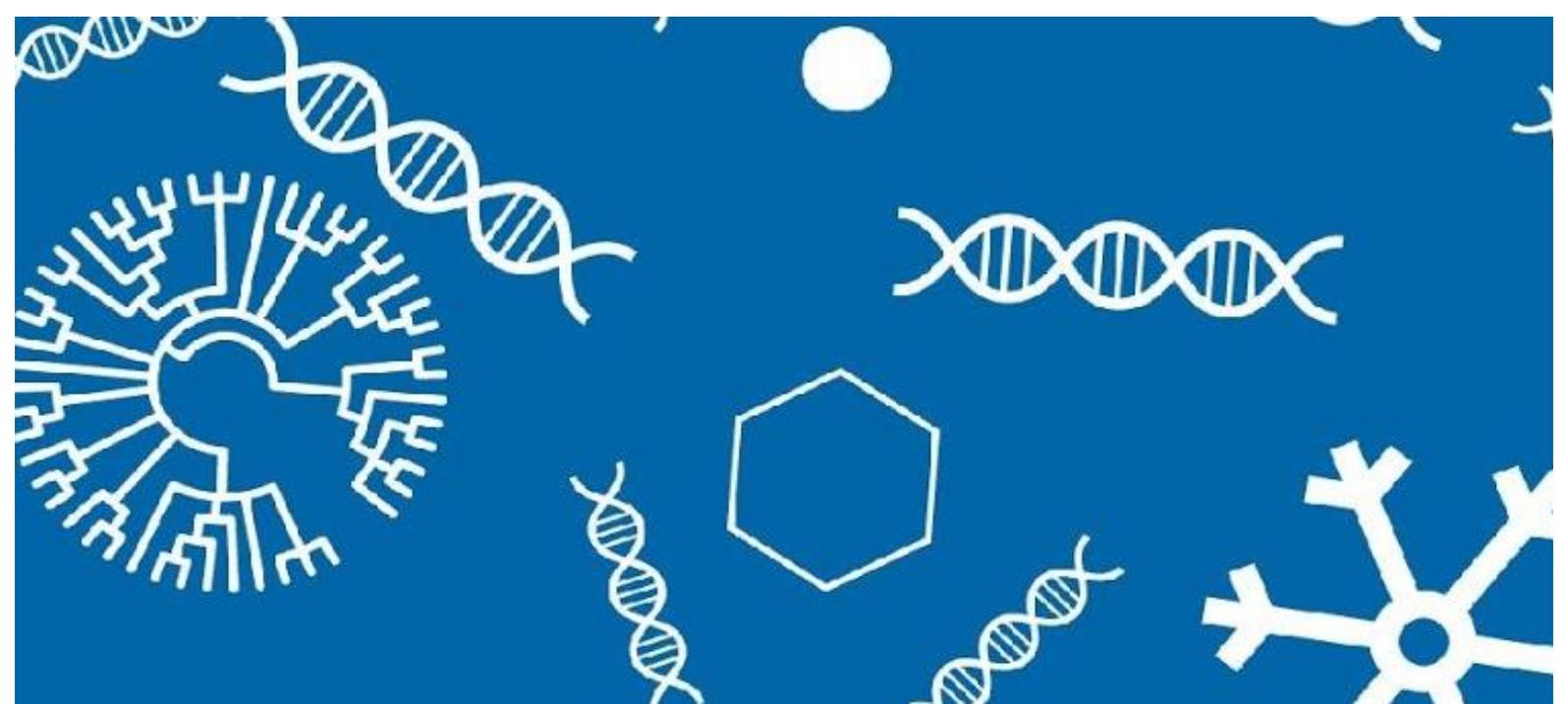
ENHANCING FROZEN COLLECTIONS ACROSS THE UK

CRYOARKS

ANIMAL BIOBANKING FOR RESEARCH AND CONSERVATION



THE UNIVERSITY
of EDINBURGH



How To Use The CryoArks Data Template For Your Data Collection

Written by Kirsty Lloyd, BBSRC CryoArks Technician

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Product of CryoArks Partner:



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The CryoArks data template

a The scope of this document

The purpose of this document is to assist anyone who has downloaded the CryoArks data template from the [CryoArks website resources page](#) (see figure 1.1) and wishes to use it for their own data collection. This guide covers everything from when you first open the spreadsheet to entering data into each tab and submitting the data/samples to the biobank should you wish to become more involved in the CryoArks project.

Although this document provides guidance for how to make the most of the CryoArks data template and the template itself was intended to assist any and all members of the research and conservation community, there may be certain features or fields that are less relevant to your individual needs. Nevertheless, we hope that you find the template useful and that you can incorporate it into your data workflow, or that it provides a helpful reference that you can refer to when developing your own template.

b What is the CryoArks data template?

Our data template has been developed based on the extensive experience and expertise of the CryoArks team and its partners. The data template was developed primarily using the [Darwin Core](#) and [GGBN](#) data standards. It is a single data collection template generated by a multidisciplinary consortium and therefore incorporates sections and fields appropriate to the university, museum and zoo research communities.

Whilst it includes an extensive range of fields to record data associated with all aspects of sample collection, transportation and storage, the CryoArks data template includes features that assist in making data entry quick and simple.

Buttons to switch between tabs, dropdown menus, clear field descriptions, example data and the ability to selectively reveal or hide fields based on the data entered are some of the useful features of the template.

The sections covered and fields included in each section are deemed necessary and/or informative at different stages of sample collection; from the taxonomy of the organism which was sampled and the locality from which it resided to the conditions under which the sample was transported and stored.

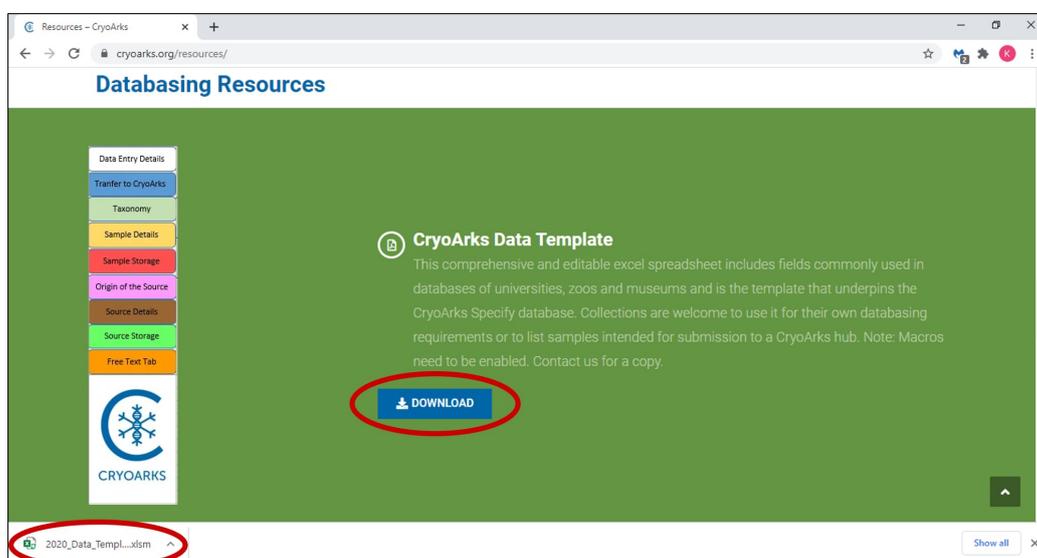


Figure 1.1: The data template can be found under the heading Databasing Resources on the resources page of the CryoArks website. It is freely available to download by clicking the download button circled in red. It will appear as an .xlsm file (also shown in red) as it contains a macro which runs in the background to help maintain some of the functionality.

c Why use the CryoArks data template?

The CryoArks data template is a comprehensive resource for anyone intending to collect data on samples for research and conservation and is applicable across the university, museum and zoo sectors.

All of the sections and fields in the data template help generate a clear picture of the history of the sample. Should you be able to collect data for

each section of the template you will be capturing information on the individual from which the sample was generated, linked clearly to the data for the sample/s themselves. Such information can be extremely useful for future research, even providing some information on sample quality for choosing the most appropriate molecular techniques to use.

We are mindful that collecting data to this level of detail can be difficult, especially in the field. However, should it be used to inform the type of data that could be collected and how that data could be structured, the template will assist you to generate as complete a dataset as possible.

Furthermore, you may wish to submit your data to be made discoverable on the [CryoArks database](#), or join the CryoArks Biobank by donating a collection (in whole or part) to be cared for at one of the [CryoArk hubs](#). However you decide to become more involved in the CryoArks project, the data collected using the CryoArks data template will include all the required information essential for anyone wishing to use the samples in the future.

How to get the most out of the data template

The first section in this chapter deals with some of the basic features of the data template. It begins with the prompts you will see upon first opening the spreadsheet, therefore we encourage you to read this section before moving on to the individual tabs.

The subsequent chapters cover the purpose and functionality of each tab in turn, therefore you will be able to skip ahead to the tab which you are most interested in/need assistance with as you please. Lastly, there is a frequently asked questions section covering all of the common questions you may have when beginning to use the CryoArks data template.

a A few points to note before you begin

- Firstly, upon opening the file you will be prompted to 'Enable Editing' and 'Enable Content' in the header ribbon (shown in figure 2.1). Be sure to do both in order to allow the background macros to run, this enables the full functionality of the template to work effectively.
- On the left hand side of the spreadsheet there are buttons (outlined in red in figure 2.2) which will enable you to easily move between tabs.
- Required fields are indicated by the word 'Mandatory' where appropriate (outlined in green in figure 2.2). This is essential information should you decide to submit your samples and/or data to the CryoArks Biobank.

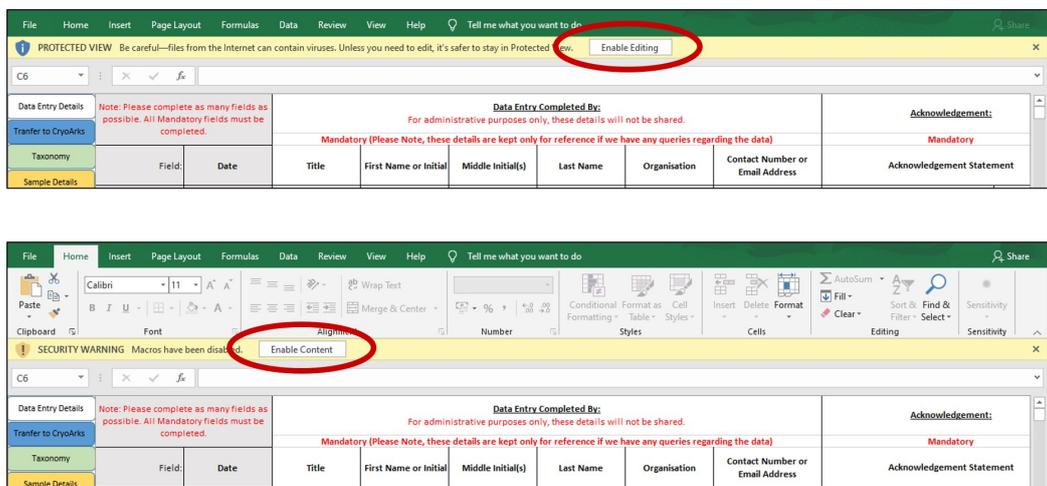


Figure 2.1: A banner at the top of the spreadsheet prompts you to 'Enable Editing' (top), once clicked a second banner will appear asking you to 'Enable Content' (bottom).

- Other important notes associated with a section of fields will be displayed in red text below the sub-category heading (identified in green in figure 2.2).
- A description of each field, suggestions for how to format the data, and an example of the type of data you might enter is provided below the field name (marked in blue in figure 2.2).
- The area below the field description is entirely editable or may contain dropdown menus with a full range of suggested entries (see the area marked in purple in figure 2.2).
- The counter running to the left hand side of the editable area (marked in brown in figure 2.2) is simply to help keep track of the number of entries across tabs in the spreadsheet.
- The CryoArks symbol embedded in each tab (marked in black in figure 2.2) is a hyperlink button which will take you directly to the [CryoArks website](#).

7

Switch between tabs

Mandatory fields

Field instructions

Hyperlink

Counter

Editable Space

Field:	Date	Title	First Name or Initial	Middle Initial(s)	Last Name	Organisation	Contact Number or Email Address	Acknowledgement Statement		
Example:	2019_01_09	Mrs	Joe	J	Bloggs	NHM	44 (0) 7777 777 777	The Samples were collected by Joe Bloggs as part of the hypothetical project.		
Field Description:	The date/date range when the data was entered into the CryoArks data template. Please format dates as: YYYY-MM-DD		Please enter the name of the person entering the data into this spreadsheet.			Please enter the organization name of the person entering the data into this spreadsheet.	Please enter the contact details of the person entering the data into this spreadsheet. If entering a telephone number begin with the country code e.g. +44	Please enter the statement of acknowledgement like to be included if/when the samples are accessed through the CryoArks database. If acknowledgement is different for different groups being donated, please write each statement in a separate cell below and state the samples to which each cell refers to on the right of that cell.		
Counter :	1	2	3	4	5	6	7	8	9	10

Figure 2.2: The basic functions of the data template are shown here. Circled in red the buttons on the left of the spreadsheet allow you to move between tabs, in black there is a hyperlink to the CryoArks website, in green is the area indicating if a field is mandatory, in blue are the field description and example data to assist in data entry, in brown the counter and in purple the editable area where you can enter your data.

- There are certain fields which enable you to reveal further hidden fields based on your selection from a dropdown menu. This function is recurring throughout the spreadsheet and is always indicated by blue text in the field description stating 'Further fields will appear as appropriate to your selection' (shown in figure 2.3). Click on the 'Please Select' text in the appropriate cell, choose the option relevant to your situation from the dropdown menu as shown in figure 2.3. **Click away from the cell then back onto it** to enable further fields to be revealed to the right of your selection.

Mandatory	Mandatory	Mandatory	Mandatory	Mandatory
Transfer of data and/or samples?	Type of Organization?	Open Access	Donor Organisation	Open Access
Data and Samples	Zoo	Yes - I consent	Organisation Name	Yes - I consent
Please select whether only the data, or the data and samples are to be transferred. Further fields will appear as appropriate to your selection.	Please select from the dropdown menu.	State whether you consent to the 'Type of Organization' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selecting.	The organisation from where the samples are being offered.	State whether you consent to the 'Organization Name' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selecting.
Data Only	Please Select	Please Select		Please Select
Please Select	Please Select	Please Select		Please Select
Data Only	Please Select	Please Select		Please Select
Data and Samples	Please Select	Please Select		Please Select
Not to be transferred to CryoArks	Please Select	Please Select		Please Select

Figure 2.3: Where in the field description you see 'Further fields will appear as appropriate to your selection' stated in blue and circled in red, upon selecting an option in the dropdown menu for that field (**once you click off then back onto that selection**) new fields appropriate to your selection will be revealed to the right of that field circled here in green.

- The 'Open Access' fields highlighted in white text (shown in red in figure 2.4) is mandatory and enables you to indicate whether you consent to specific sections of information (that you have filled in to the left of the field) being made publicly accessible on the CryoArks online database. We process personal data as per our Data Privacy Notice (that may be amended from time to time) set out on our [Privacy Policy webpage](#). By selecting 'Yes - I consent' you acknowledge and accept that the specified section of information may be shared and made publicly available via the CryoArks database data portal. By selecting 'No - I DO NOT consent' the specified information will be withheld from public view on the data portal, but it may be shared with CryoArks employees, consultants, sub-contractors and/or collaborators who need to access it for the purpose

of carrying out the CryoArks project. For more details on how we use personal data please read our [Privacy Policy](#).

Mandatory
Open Access
Yes - I consent
State whether you consent to the 'Lot Details and Description' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selecting.
Please Select
Please Select Yes. I consent. No. I DO NOT consent. Not Applicable

Figure 2.4: The 'Open Access' fields offer the option to choose what data is made available on the CryoArks data portal. Circled in red are the links to this guidance document and our Privacy Policy to refer to when making your selection.

- An important field in the 'Transfer to CryoArks' tab (highlighted in red in figure 2.5) is the 'Primary Sample Identifier' shown in green in figure 2.5. The identifier entered into this column **will automatically be copied over to all tabs and will appear in the same column in each tab**. This enables you to keep track of which sample you are entering the associated data for per row in each section. Should you have more than one identifier associated with a single sample there is a space to record these in the Sample Details tab (shown later in this document).

Data Entry Details	Sub Category: <u>Acquisition Details</u>	
Transfer to CryoArks		Mandatory
Taxonomy	Field	Primary Sample Identifier
Sample Details		(The ID written on the tube). E.g. Site001
Sample Storage	Example	
Origin of the Source		The individual sample identification code/number. These IDs will be copied to this field on all tabs.
Source Details	Field Description	Please select whether only the data, or the data and samples are to be transferred. Further fields will appear as appropriate to your selection.
Source Storage		
Free Text Tab		
	Counter :	1
		2
		3
		4
		5
		6
		7
		8
		9
		Please Select

Figure 2.5: The Transfer to CryoArks tab (button circled in red) with the 'Primary Sample Identifier' field circled in green. Identifiers entered in this column will automatically be copied to the same column in each tab.

b Data Entry Details

This tab primarily records the details of the person who entered the information into the spreadsheet (see the fields highlighted in green in figure 2.6). This information will enable you to keep a clear record of who completed the data entry should anyone have any queries regarding the data in the future.

Should you wish to submit your data and/or samples to the CryoArks project the information in this section would be used for administrative purposes only. It will not be shared with anyone outside of CryoArks staff and may only be used if queries arise regarding the data that you have provided.

Also included in this tab is the acknowledgement statement (see the section highlighted in blue in figure 2.6). This caters for specific acknowledgements to be included with the sample data when it is published on the CryoArks database. Anyone wishing to access the samples for research will be instructed to include this statement in any publications associated with the samples.

Data Entry Completed By: <small>For administrative purposes only, these details will not be shared.</small>						Acknowledgement:	
Mandatory (Please Note, these details are kept only for reference if we have any queries regarding the data)						Mandatory	
Title	First Name or Initial	Middle Initial(s)	Last Name	Organisation	Contact Number or Email Address	Acknowledgement Statement	
Mrs	Joe	J	Bloggs	NHM	44 (0) 7777 777 777	The Samples were collected by Joe Bloggs as part of the hypothetical project.	Samples A - H
Please enter the name of the person entering the data into this spreadsheet.				Please enter the organization name of the person entering the data into this spreadsheet.	Please enter the contact details of the person entering the data into this spreadsheet. If entering a telephone number begin with the country code e.g. +44	Please enter the statement of acknowledgement you would like to be included if/when the samples are accessed via a request through the CryoArks database. If the acknowledgement is different for different groups of samples being donated, please write each statement in a separate cell below and state the samples to which each corresponds to the right of that cell.	

Figure 2.6: The Data Entry Details tab captures information on the person who entered the data into the spreadsheet (circled in green) and any acknowledgements which should be associated with a sample or range of samples (circled in blue).

c Transfer to CryoArks

Should you wish to become more involved in the CryoArks project the 'Transfer to CryoArks' tab is intended to capture the necessary details for this to take place. The tab gives the option of transferring the 'Data Only' to be made publicly accessible on the CryoArks database or the 'Data and Samples' to be housed at one of our core facilities, and shows further relevant fields accordingly.

There are many reasons why becoming more involved with the CryoArks project can be beneficial, not least that you can back up your samples by housing a duplicate collection in a purpose built cryo-facility at one of the [CryoArks hubs](#). You can also enhance research and collaboration opportunities on a taxon of interest by making samples discoverable through the [CryoArks database](#). Further information about the CryoArks project and the benefits of being involved can be found on the [Join CryoArks](#) webpage.

This tab also deals with any legal documentation associated with the sample e.g. permits relevant to sample collection, CITES documentation and the Nagoya Protocol. [The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization \(ABS\)](#) provides a legal framework for implementing the third objective of the Convention on Biological Diversity. It aims to encourage the sharing of benefits derived by users of genetic resources with those who provide them. The ultimate objective is the conservation and sustainable use of biodiversity.

Compliance requires all users of genetic resources (those conducting research and development) to demonstrate due diligence, ensuring the resources and associated traditional knowledge are accessed and used in accordance with applicable legislation of the providing country. It entered into force on 12 October 2014, therefore any associated documentation detailing the ABS requirements which apply to a sample/s collected post October 2014 should be referenced by anyone intending to use the samples for research purposes.

Should the sample/s have been collected after 2014 from a country that has ratified the Nagoya Protocol and has ABS requirements but no documentation is available detailing these requirements, anyone wishing to use the sample/s should take reasonable steps to contact the appropriate national authority and renegotiate the terms of use. For more information and guidance on the Nagoya Protocol see the [Convention on Biological Diversity](#) webpage.

Figure 2.7 shows the 'Nagoya Status' field within the data template. In this field we ask whether the sample was collected after 2014 from a country that has ratified the Nagoya protocol and has associated access and benefit sharing (ABS) requirements? And if so, whether documentation is available upon request to show compliance? The potential answers in the dropdown list are:

1. The sample was collected **pre** 2014 and is not subject to the Nagoya Protocol.
2. The sample was collected from a country that has **not** ratified the Nagoya Protocol.
3. The sample was collected **post** 2014 from a country that has ratified the Nagoya Protocol but has **no** ABS requirements.
4. The sample was collected **post** 2014 from a country that has ratified the Nagoya Protocol with ABS requirements. Related documents are available.
5. The sample was collected **post** 2014 from a country that has ratified the Nagoya Protocol with ABS requirements. Documents are **not** available.
6. The year and/or the country from which the sample was collected are not known.

Nagoya Status
2. The sample was collected from a country that has not ratified the Nagoya Protocol.
Was the sample collected after October 2014 from a country that ratified the Nagoya Protocol with access and benefit sharing (ABS) requirements and is there documentation to show compliance?
Please Select
Please Select
1. The sample was collected pre 2014 and is
2. The sample was collected from a country t
3. The sample was collected post 2014 from a

Figure 2.7: The 'Nagoya Status' field with the field description circled in red.

The 'CITES Status' field in the data template (shown in figure 2.8) allows you to enter the CITES appendix number applicable to the animal from which the sample was taken. If Appendix I,II or III applies you are then able to enter the CITES Permit number and details of the associated documentation in the 'CITES Documentation File Name' field. In this field you could either enter the full file name or add a link to a document by right clicking on the cell, selecting 'link' and navigating to the appropriate file within the 'Insert Hyperlink' menu.

CITES Status	CITES Permit Number	CITES Documentation File Name
Appendix I	CITES Import Permit - XXX0001	001_CITES_Doc.pdf
Please select from the dropdown menu the CITES status of the organism. Further fields will appear appropriate to your selection.	Please describe any associated CITES documentation. If not applicable please specify why.	Proof of CITES compliance multimedia file name
Appendix I		
Please Select Appendix I Appendix II Appendix III None		

Figure 2.8: If Appendix I,II or III is selected from the dropdown menu of the 'CITES Status' field (circles in red) additional fields will appear allowing you to enter the CITES permit and multimedia file details (circled in green).

Similarly, should there be any research or collection permits associated with the sample collection, this information is captured in the 'Other Associated Permits' section (shown in red in figure 2.9). Selecting 'yes' here reveals fields that capture the permit type, permit number, permit details and a file name or hyperlink to a document (highlighted in green in figure 2.9).

Other Associated Permits?	Permit Type	Permit Reference Number	Permit Details	Permit File Name
Yes	Collecting Permit	XXX0001	Permit for collection granted 08/09/2016	001_Permit_Doc.pdf
Please select if other permits and licenses are relevant to the sample (E.g. HO license). Further fields will appear based on your selection.	The name of the permit that authorised the collection of the organism/sample	Please state the permit Reference number e.g. Home office licence number, research permit number etc.	Information about the permit associated with the sample(s) including the date awarded, duration and its status.	The accompanying permit multimedia file name
Yes				
Please Select				

Figure 2.9: The 'Other Associated Permits' field circled in red with the fields that are revealed should the user select 'yes' circled in green.

If the sample was collected from a country that has not ratified the Nagoya Protocol but has its own access and benefit sharing requirements these can be recorded in the 'Other Associated Permits' section. A brief description of any associated usage restrictions can be included in the 'permit details' field and/or the usage agreement document name or a hyperlink to the file can be entered in the 'Permit File Name' field.

Furthermore, if you have selected that you do not intend to transfer either the samples or the data associated with your collection to the CryoArks project, fields relating to the transfer will be hidden. However, fields relating to the Nagoya status, CITES status and other permits will still be revealed enabling you to gather and store that information for your own records.

d Taxonomy

The Taxonomy tab deals with the taxonomic designation of the organism from which the sample was taken. Complete the taxonomic designation (such as the fields highlighted in red in figure 2.10) to the lowest taxonomic level possible.

The binomial name (highlighted in green in figure 2.10) will autofill based on the taxonomic information entered. The IUCN categorisation for the species (also highlighted in green in figure 2.10) will be completed by CryoArks staff from the IUCN Red List of threatened species, however if the categorisation is known this can be selected from the dropdown menu.

Taxonomy:				Names and Designations			
Fields in red are not known, write 'unknown' in the mandatory fields and complete to the lowest taxonomic level possible.							
Mandatory		Mandatory				Mandatory	
Genus	Subgenus	Species	Subspecies	Determination Citation	Common name	Full Binomial Name	IUCN Designation
Lynx		lynx	balkanicus	Buresh, I. 1941. Risove v Makedonija Lynx in Macedonia. Priroda 42(3): 51-52.	Balkan Lynx	Lynx lynx balkanicus	Critically Endangered
The scientific name of the genus in which the taxon is classified.	The scientific name of the subgenus in which the taxon is classified.	The name of the species.	The name of the subspecies, if known	Citation of the taxonomic designation should ideally be formatted as follows; Author, Initial. Year. Title of article or book. Publication name. Volume(issue number); page range.	Please state the common (local/vernacular) name you have used to refer to the organism.	This will be autofilled based on information placed in previous cells.	If the IUCN Red List of Threatened Species categorisation is known please select it from the dropdown menu
							Please Select

Figure 2.10: The Taxonomy tab captures the full taxonomic designation of the organism for which the sample was taken. It also includes the common name and IUCN categorisation if known.

e Sample Details

The purpose of this tab is to collect information on the sample itself. This includes whether the sample is a tissue, DNA extract or other sample type, who prepared the sample, how the sample was prepared, metrics relating to the sample (e.g. its volume and concentration) as well as whether there is any published data associated with the sample.

This tab does not deal with information on the animal from which the sample came from, only information relating to the sample itself. More fields relevant to the type of sample you have will be revealed dependant on your selection in the 'Type of Sample' field (indicated in red in figure 2.11).

Sample Details				Other Identifiers					
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory
Type of Sample	Tissue Type	Preservation	Open Access	Other Identifiers (e.g. lab or project code/reference)	Prepared by Title	Prepared by First Name Or Initial	Prepared by Middle Initial(s)	Prepared by Last Name	Prepared by Organisation
Tissue	Muscle from the Thoracic Wall	Dry (no preservative)	Yes - I consent	2	Ms	Jo	X	Bloggs	Hypothetical Zoo
What is the sample? Select from the dropdown list. Further fields will appear as appropriate to your selection.	Please specify the limb or organ from where the tissue sample was taken (e.g. muscle, connective, epithelial, nervous)	What is the sample preserved in? Please select from the dropdown list.	State whether you consent to the 'Sample Details' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selecting.	Please indicate the number of identifiers associated with this sample. Fields will appear based on your selection.	Please give details of the person and/or institution responsible for preserving the sample. If either the persons name or the organisation is not available please write unknown, however either one or the other must be provided.				
Tissue	Please Select	Please Select	Please Select	Please Select					
DNA	Please Select	Please Select	Please Select	Please Select					
Field	Please Select	Please Select	Please Select	Please Select					
Culture (cell)	Please Select	Please Select	Please Select	Please Select					
Blood	Please Select	Please Select	Please Select	Please Select					
Hair	Please Select	Please Select	Please Select	Please Select					
Feather	Please Select	Please Select	Please Select	Please Select					
Urine	Please Select	Please Select	Please Select	Please Select					

Figure 2.11: The Sample Details tab with the 'Type of Sample' field circled in red. The option selected here will determine the selection of relevant fields that are revealed to the right hand side of the 'Other Identifiers' field, circled in green.

An identifier is any number/code unique to that sample. E.g. any lab or project number. If there are other identifying numbers/codes associated with the sample, aside from the one given as the 'Primary Identifier' in the 'Transfer to CryoArks' tab (see figure 2.5), please select the amount in the 'Other Identifiers' field (indicated in red in figure 2.12).

Other Identifiers					
Other Identifiers (e.g. lab or project code/reference no.)	Other Number 1	Kind	Other Number 2	Kind	Mandatory Open Access
2	001LynxHZoo	Handwritten in permanent marker on tube	001LynxHZoo	Handwritten in permanent marker on tube	Yes - I consent
Please indicate the number of identifiers associated with this sample. Fields will appear based on your selection.	Any additional lab or project numbers associated with the preparation sample? (e.g. Tissue ID, derivative or lab code.)	Please give a brief description of what kind of number/label/identifier the other associated number is.	Any additional lab or project numbers associated with the preparation sample? (e.g. Tissue ID, derivative or lab code.)	Please give a brief description of what kind of number/label/identifier the other associated number is.	State whether you consent to the 'Other Identifiers' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selecting
2					Please Select
Please Select					Please Select
1					Please Select
2					Please Select
3					Please Select
4					Please Select
5					Please Select

Figure 2.12: The 'Other Identifiers' field circled in red with 2 selected. Therefore, 2 identifiers are able to be entered in the fields revealed to the right, circled in green.

A 'number' and 'kind' field will appear (indicated in green in figure 2.12) as appropriate to the amount of identifiers you have selected. You are able to input the other identifier/s in the 'Other number' field and a brief description of what kind of identifier it is (i.e. its association with the sample) in the 'kind' field.

f Sample Storage

The purpose of this tab is to collect information on the storage history of the sample. **This tab does not deal with information regarding the organism from which the sample came from, only information about the sample itself.**

The 'number of stages in the transport chain' field (shown in red in figure 2.13) relates to the number of storage or transportation steps prior to the sample being deposited into permanent storage. To the right of this field you will see an area to record the location of the sample within your facility (see fields highlighted in green in figure 2.13). This is solely for your records and should the data be transferred to the CryoArks database this information will not be stored.

Sub Category:	Sample Preservation History <small>(These details are specifically about the sample storage history, not the animal from which the sample was taken.)</small>		Current Location of the Sample: <small>This information is for your reference only and will not be shared or made publicly available</small>					
Primary Sample Identifier <small>(The ID written on the tube). E.g. Site001</small>	Number of Stages in the Transport Chain <small>E.g. If the sample was firstly stored in the freezer, then transported on ice to its long-term storage destination, you would select 2 stages in the transport chain.</small>	Freezer Name / Number	Freezer Shelf	Freezer Rack	Freezer Drawer	Box Position	Coordinates of the Tube in the Box	Storage Temperature °C
The individual sample identification code/ number	Please select from the list the number of different stages in the transport chain that affected the sample (from initial collection until long term preservation). If this information is not available, please select unknown. Further fields will appear as appropriate to your selection.	The freezer in which the sample is stored, and/or a description of the freezer location.	The location of the sample within the freezer.					Temperature of specimen, tissue, DNA or RNA preservation or storage. Select from list
	Please Select							Please Select
	Please Select							Please Select
	Please Select							Please Select
	Please Select							Please Select
	Please Select							Please Select
	Please Select							Please Select

Figure 2.13: The number of storage or transportation steps prior to the sample being deposited into permanent storage can be selected from the dropdown menu of the 'number of stages in the transport chain' field circled in red and the location in which the sample is ultimately stored can be recorded in the area circled in green.

Once the number of stages in the transport chain is selected you will see the 'Freeze/Thaw' field appear (highlighted in red in figure 2.14) to the right. This records the number of times the sample has undergone a phase change in total. To the right of the 'Freeze/Thaw' field each stage of the transport chain will be represented by a 'Transport Chain Iteration' (shown in green in figure 2.14). This grouping of 4 fields enables you to record the conditions during each transport/storage stage. The final 3 fields which will appear relate to the final/permanent storage conditions in which the sample was placed (see the area highlighted in blue in 2.14).

If, for example, the sample was stored in a portable freezer after collection, transported on ice then placed in its permanent location in a research

institution, you would select two stages for the storage/transport chain. One stage would describe the portable freezer conditions and a second stage would describe the transportation conditions, therefore you would select 2 in the 'number of stages in the transport chain' and input the permanent storage conditions in the final 3 fields. If it had not undergone a phase change during this process then you would enter 0 in the 'Freeze/Thaw' field.

Freeze/Thaw	Transport Chain: Stage 1				Permanent Storage Conditions			Notes
Mandatory								
Freeze/Thaw Total	Interim storage Interval Duration	Storage Temperature °C	Storage Buffer/Preservative	Storage/Transport Details	Storage Temperature °C	Storage Buffer/Preservative	Storage/Transport Details	Sample Preservation Notes
1	1 Day	-20°C	Dry (no preservative)	Placed immediately in freezer aboard ship	-80°C	Dry (no preservative)	Carried on dry ice and placed in the freezer	
Please state the total number of times the sample underwent a phase change. If unsure provide approx. or write 'unknown'	Please select the approximate length of time during which the sample was stored/transported at this stage in the	The temperature of transportation or storage. Please select from the dropdown list.	The buffer/preservative used. Please select from the dropdown list.	Please describe in brief the transport/storage conditions e.g. container, shipping parameters, time etc	The temperature of the final/permanent storage conditions. Please select from the dropdown list.	The buffer/preservative used. Please select from the dropdown list.	Please describe in brief the transport/storage conditions e.g. container, shipping parameters, time etc	Free text field for any other details regarding the sample preservation.

Figure 2.14: The 'Freeze/Thaw' field circled in red captures the number of times the sample has undergone a phase change. The fields circled in green, the 'Transport Chain Iteration' capture the storage/transportation conditions and are repeated dependent on the number of stages selected. Finally the area circled in blue captures the storage conditions under which the sample is being held long term.

g Origin of the Source

This tab covers the location from which the animal that was sampled originated. In the 'Origin of the Source Animal' field (shown in red in figure 2.15) select the scenario which best represents your circumstances.

'Wild Caught' enables you to enter details relating to the geographic location from where the animal was originally collected be that from land or a water body. In the case of a zoo animal the 'Captive Bred' options enable you to enter data relating to its captive history including its breeding (the fields relevant to the option selected will appear to the right as shown in green in figure 2.15).

'Captive - Wild Born' relates to an animal which was originally captured from the wild but was sampled when housed in a captive environment. Conversely 'Wild Caught - Captive Bred' describes an animal which was born in captivity, released and sampled when in the wild. Both options will reveal fields that capture locality information as well as captive history details as appropriate.

Collection Details of the Source Animal (These details are about the animal from which the sample was taken)	Captive History Details			Breed and Origin		
	Mandatory	Mandatory	Mandatory			Mandatory
Origin of the Source Animal:	Individual Identifier	Estimated Age/DOB	Open Access	Breed	Population	Open Access
Wild Caught - Captive Bred	2	estimated at 4 years	Yes - I consent			Yes - I consent
Please select how the animal from which the sample was taken was originally obtained. Further fields will appear appropriate to your selection.	Please indicate how many identifiers are associated with this individual. Fields will appear based on your selection.	Please state the date of birth or if not known the approximate age of the animal when the sample was collected.	State whether you consent to the 'Estimated Age/DOB Details' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selection.	Please include details of the breed if known/applicable.	Please include details of the captive population from which the animal originated if known/applicable.	State whether you consent to the 'Breed and Origin Details' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selection.
Captive Bred	Please Select		Please Select			Please Select
Please Select	Please Select		Please Select			Please Select
Wild Caught	Please Select		Please Select			Please Select
Wild Caught - Captive Bred	Please Select		Please Select			Please Select
Captive - Wild Born	Please Select		Please Select			Please Select
Captive Bred	Please Select		Please Select			Please Select
For e.g. carcass found due to road kill, predation, etc.						

Figure 2.15: The 'Origin of the Source Animal' field circled in red enables you to select the scenario which best represents the origin of the animal from which the sample was taken. Fields relevant to the selection will appear to the right, circled here in green.

h Source Details

This tab handles information relating to the animal from which the sample was taken (the source animal). Specifically, details of how the taxonomic identification was determined, any morphological descriptions made, the animal's condition when the sample was taken and any identification/record numbers associated with the source animal (not the sample).

Once the 'Type of Project' is selected (see the field highlighted in red in figure 2.16) you will see fields appropriate to your selection appear to the right (see fields highlighted in green in figure 2.16). The options presented in this field are intended to facilitate quicker and simpler data entry by revealing additional fields appropriate to your circumstances. However, the list is not exhaustive and therefore your specific situation may not be represented in the dropdown list. Please select the option which reveals the fields most relevant to you.

(These fields are about the animal from which the sample was taken)	Identification of t				
Mandatory					
Type of Project	Identified by Title	Identified by FirstNameOrInitial	Identified by Middle Initial(s)	Identified by Last Name	Open Access
Zoo Resident	Mr	John	D	Doe	Yes - I consent
Please select from the dropdown menu the type of project for which the animal was sampled. Further fields will appear as appropriate to your selection.	The name of the person who made the taxonomic identification of the animal from which the sample was taken, if known.				State whether you consent to the 'Identifier Details' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selecting.
Academic Research					Please Select
Please Select					Please Select
Museum Specimen					Please Select
Zoo Resident					Please Select
Academic Research					Please Select
Other program e.g. NBO or Gov					Please Select

Figure 2.16: The 'Type of Project' field (circled in red) relates to the project during which data about the source animal and/or the source animal itself was captured. The selection made in this field will affect the type of data that is captured in the tab by determining which fields are revealed to the right, circled here in green. Select that which most closely represents your project type.

i Source Storage

The purpose of this tab is to collect information on **the storage history of the animal before the sample was taken, it does not include the storage history of the sample itself** which is dealt with in the 'Sample Storage' tab.

If the individual was alive when the sample was collected (e.g. in the case of blood samples) skip this section as details of sample collection are covered in the 'Sample Details' tab and the storage history of the sample itself is covered in the 'Sample Storage' tab.

If the sample was taken immediately upon the death of the animal select 'sampled immediately' from the dropdown menu in the 'number of stages in the transport chain' field (shown in red in figure 2.17). Select the same field if the sample is the whole animal (e.g. if a whole insect was collected).

If the sample was taken after the death of the animal, then select the number of stages in the transport chain (from the field shown in red in figure 2.17). The number selected relates to the number of storage or transportation steps of the source animal before the sample was taken.

Source Animal Preservation History (This section is about the animal from which the sample was taken, not the sample itself)		Freeze/Thaw	Transport Chain: Stage 1			
Number of Stages in the Transport Chain Up Until the Sample was Taken	Mandatory Open Access	Mandatory Freeze/Thaw Total	Interim storage Interval Duration	Storage Temperature °C	Storage Buffer/Preservative	Storage/Transport Details
E.g. if after death, the animal was held in a cold room, then stored in the freezer before being thawed for sample collection, select 2 stages in the transport chain and 1 freeze/thaw.	Yes - I consent	1	1Day	-20°C	Dry (no preservative)	Placed immediately in freezer aboard ship
Please select the number of stages in the transport chain in between the death of the source animal and the sample being taken. If this information is not available please select unknown. Note: if the individual was alive when the sample was taken you do not need to complete this section. Further fields will appear as appropriate to your selection.	State whether you consent to the 'Source Animal Preservation History' being made publicly accessible on the CryoArks data portal. See our data template guidance and privacy policy prior to selecting.	Please state the number of times the carcass was thawed after freezing before it was sub-sampled.	Please state the approximate length of time during which the sample was stored/transported at this stage in the chain.	The temperature of transportation or storage. Please select from the dropdown list.	The buffer/preservative used. Please select from the dropdown list.	Please describe in brief the transport/storage conditions e.g. container, shipping parameters, time etc.
1	Please Select			Please Select	Please Select	
Please Select Unknown	Please Select			Please Select	Please Select	
Sampled Immediately	Please Select			Please Select	Please Select	
	Please Select			Please Select	Please Select	
	Please Select			Please Select	Please Select	
	Please Select			Please Select	Please Select	

Figure 2.17: In the 'Number of Stages in the Transport Chain' field (circled in red) the number of storage or transportation steps before the sample was taken from the source animal can be selected in the dropdown menu. The 'Freeze/Thaw' field capturing phase change data will appear to the right, as well as 4 fields which capture the storage/transportation conditions (circled in blue), these repeated per the number of iterations selected.

If the sample was taken from a part of an animal or the deposit left by an animal the transportation and storage history of this specimen prior to sampling will still be relevant. For example, if the sample was taken from a faecal deposit, animal remains found or from an organ that had been resected, then only the conditions from when the specimen was collected may be known. But if the specimen underwent a repeated phase change this may still impact the quality of the sample taken subsequently.

Once the number of stages is selected you will see the 'Freeze/Thaw' field appear (shown in blue in figure 2.17). This field captures the number of times the source animal part/carcass underwent a phase change before the sample was taken.

Each stage of the transport chain will be represented by a 'Transport Chain Iteration' (shown in blue in figure 2.17). This grouping of 4 fields enables you to quickly describe the conditions during transportation/storage of the carcass/animal part up until the sample was taken.

j Free Text Tab

The CryoArks data template includes a whole host of categories and fields that enable you to gather a clear picture of the sample history and even quality. You may wish to use the data template in order to generate data for a collection which you are intending to donate to the CryoArks Biobank, be it a unique, duplicate or back-up collection to your working samples.

Regardless of whether you intend to share the data with the CryoArks project the template can also be used for your project specific data by making use of the 'Free Text Tab'. The rows and columns of this tab are entirely editable for you to collect data that is relevant to you and your project (see the area highlighted in figure 2.18).

Sub Category:					
This tab does not contain any suggested or required fields, it is a entirely editable for you to add fields/data that is unique to your collection/project. 9					
Field:	Primary Sample Identifier				
Example:	(The ID written on the tube). E.g. Site001				
Field Description:	The individual sample identification code/ number.				

Figure 2.18: The area of the Free Text Tab circled in red is entirely editable for you to add your own field headings and descriptions.

Should you wish to transfer the data to the CryoArks database we will not use any information in this tab unless you state that you wish it to be included.

k Frequently Asked Questions

- **What if I don't have the information to complete all of the tabs?**
We understand you may not have information about all aspects of the sample history. Any tabs for which you have no information please leave blank. However, please endeavour to complete all of the mandatory fields if you are considering donating data or samples to the CryoArks biobank.
- **I don't have enough information to fill in all of the mandatory fields?**
We understand that in some situations you may not have a lot of data associated with your sample. If you are considering transferring your collection to the CryoArks Biobank all donations will be considered on a case by case basis. Please get in touch using the details below.
- **How can I get help with data entry?**
If you have any questions regarding completing sections/fields within the data collection spreadsheet please get in touch using the details below.
- **My data is in a different format, do I need to transfer it?**
No, if your data has already been input into some form of database or spreadsheet we may be able to import it directly into the CryoArks database. Please get in touch to discuss your data with one of our team.
- **I can't drag and drop, how can I enter data into multiple cells?**
Unfortunately, the formatting restricts the ability to drag down from one cell to another. However it is possible to copy and paste into a cell or multiple cells. Copy and paste also works for any drop down menu selections you have made.
- **New fields are not being revealed when indicated?**
Click on the 'Please Select' text in the appropriate cell, choose the relevant option from the dropdown menu as shown in figure 2.3. **Click away from the cell then back onto it** to enable further fields to be revealed to the right of your selection. In some cases the selection made may mean further fields are not necessary (e.g. if the information is 'unknown') therefore no further fields would be revealed. However, to make sure click away from your selection then back onto it.

How CryoArks can help

If you are reading this document, you may have already visited the [CryoArks website](#), where in addition to a wealth of information and resources available, you will see that we offer advice, guidance and training.

a Submitting data/samples to the biobank

The CryoArks project is a consortium that aims to bring together diverse collections of frozen zoological material found in museums, zoos, research institutes and universities across the UK, and make them accessible to the research and conservation communities. We can help biobank both your physical samples and/or your sample data.

Physical sample donations to the CryoArks project are managed by the receiving CryoArks hubs. In donating samples to CryoArks, ownership is transferred to the partner institution holding the material. The benefit of this option is not only that the data will be made discoverable to the research community on the CryoArks database but the CryoArks hub will house and curate the collection in perpetuity.

Should you wish to retain the samples at your own institution but make the data discoverable through CryoArks this can be arranged with Cardiff University who hosts the CryoArks database. The benefit of this is that the data will be made discoverable to the research community via the CryoArks database. You would retain title over the samples and will have the support and advice of the CryoArks partners in order to manage the collection and fulfil loan requests.

See the [Join CryoArks webpage](#) for the benefits of both submission options. If you wish to proceed with either option get in touch by sending an inventory or a detailed description of your collection to enquiries@cryoarks.org.

b How to get in touch



CryoArks Main Office

OnE - Organisms and Environment Division
School of Biosciences
The Sir Martin Evans Building
Cardiff University
Museum Avenue
Cardiff
CF10 3AX
Wales, UK



www.cryoarks.org



[@cryoarks](https://twitter.com/cryoarks)



enquiries@cryoarks.org

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