EAZA Guidelines for Studbook Keeping in ZIMS

Introduction

Keeping a studbook can be overwhelming. This is normal, so do not let it discourage you! This document is meant to help you get organised when starting with or feeling stuck in ZIMS for Studbooks. Before navigating to the relevant chapters to help you, please..

Check if you have already followed a ZIMS for Studbook course? If not, it is best to do this first.

The self-paced online ZIMS for Studbooks course

During this online course you work through relevant videos and assignments in your own pace to understand the correct way of studbook keeping. This course is free and can be followed at any time during the year. Please contact Iva (iva.martincova@eaza.net) for access to the course and a training studbook. In addition, any new EEP coordinator should follow the Introduction to EEP Management Course. You can sign up by contacting Laura (Laura.Myers@eaza.net).

And remind yourself of proper studbook keeping philosophy.

Studbook keeping philosophy

- **You are the species expert and the gatekeeper of the studbook**; you decide which information should be part of the studbook and are curator of the data. Make sure the information in your studbook is true and as complete as possible. Never just make up information.
- **Add notes** whenever it is useful to record the source of information or if you make any assumptions. Making a note only takes a minute and can save you or your successor much work in the future.
- **The end goal is to have correct and factual data in your studbook.** You will find a long list of Pending updates, Suggested animals and Data Quality Errors in your studbook. It is not a goal on itself to get these numbers to zero. You can have a quality and updated studbook and still have many Data quality errors.

Tip: **Use filters** frequently and save custom filters.

Then, using the links below, you can navigate to the chapter that best fits your situation:

1. Starting with a newly created studbook
2. Working on a recently migrated SPARKS studbook
3. Updating an existing studbook

If these chapters did not answer your question, then there are still more resources.

Other resources

- If you have questions on how the software works, please contact support@species360.org or see the ZIMS for Studbooks Training Index.
- If you have questions on how to use the software, please contact the EAZA Population Management Centre (find the contacts on the EAZA Member Area). We are happy to help you with your studbook.

GETTING STARTED IN ZIMS FOR STUDBOOKS

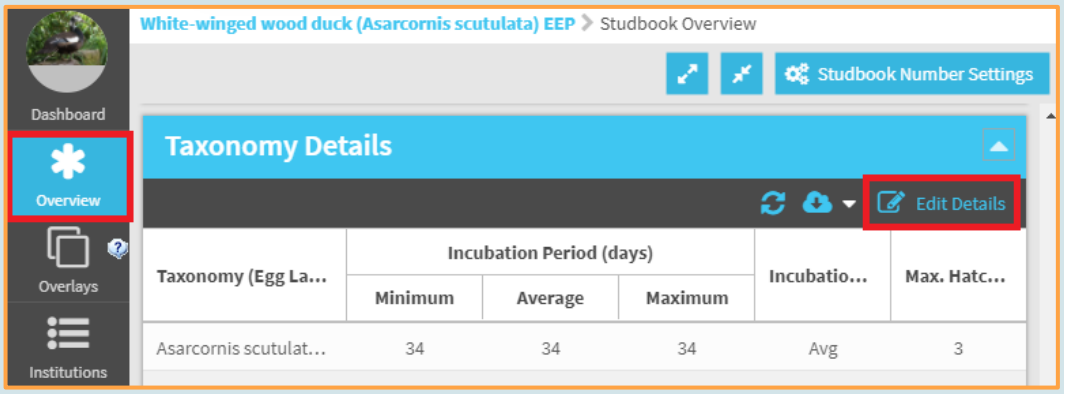
1. Starting with a newly created studbook.

Species360 can create a new ZIMS studbook with the information that holders have entered into ZIMS for Husbandry. This gives these “from scratch” studbooks a bases to start with. However, as the information in ZIMS for Husbandry is not always as complete as we would like, these studbooks usually need some work before they can be used to manage a population.

Here we give some tips to help you prioritise the work that needs to be done. We recognise this may be a lot of work and will take some time. However, with small steps it will be manageable.

Set the correct settings

When you start with a new studbook, check the studbook settings in the overview tab of the studbook to see if these are correct. The gestation/incubation period is used by the software to notify you about possible errors. You can edit this yourself by selecting “Edit Details”.
The taxonomy tells the software which taxonomies should be part of the studbook. If your studbook includes subspecies, then these should be added to the taxonomies. Please e-mail the EAZA PMC to add any taxonomies to your studbook.
If you are uncertain about the gestation/incubation period of you species, the Animal Diversity Web may be a helpful tool. To learn more about the importance of taxonomy in ZIMS for Studbook, you can read this document from Species360.



You can find the Taxonomy Details and edit them by clicking on Dashboard > Overview > Edit Details.

Managing the living animals

When you start working on the records in your studbook, your priority is to make sure you are able to manage the living animals. You want to know who is where within EAZA. Here we provide a four-step-plan to work on this:

1. *Start with the Suggested Animals List. Focus on the animals with status "Alive". Make sure these animals are part of your studbook.*
    a. When a Scratch Studbook is created only animals that were never transferred are automatically added. This is because ZIMS would like you to check if there is no conflicting information in the records of animals that were transferred between holders. Therefore, you will first need to add these animals to the studbook. Using the filters can be very helpful to sort the animals on birthdate and status (Alive or Dead).

    b. Avoid adding duplicates as much as possible. Animals might have double records in ZIMS for Husbandry. Sometimes an institution has created a new record after a transfer, rather than updating the existing record. This occurs especially in historic records, as institutions have digitalised their records without checking if the animal was already on ZIMS. If you come across a possible duplicate, you can use "Animal Comparison" under

"Tools" to compare studbook records and husbandry records with each other to see if they match. If a record is indeed a duplicate in ZIMS for Husbandry, send an e-mail to Species360 (support@species360.org) with the request to merge the two records.

c. Ignore the dead animals for now. These animals will only become relevant when you would like to analyse your population demographically and genetically.

Suggested Animals

The Suggested Animals is list of suggestions from ZIMS of records in Husbandry that may need to be part of your studbook. There are generally three reasons why a record shows up on this list:

- The animal is not yet included in your studbook. It may be new-born, or a recently entered historical record.
- The animal is already in your studbook, but not yet linked to their ZIMS for Husbandry record. You should link the two records.
- The animal is already in your studbook and is also already linked, but it has multiple records in ZIMS for Husbandry. If a record is indeed a duplicate in ZIMS for Husbandry, send an e-mail to Species360 (support@species360.org) with the request to merge the two records. If you come across an animal with a possible double record, you can use "Animal Comparison" under "Tools" to compare studbook records and husbandry records with each other to see if they match.

For more information on Suggested Animals see this EAZA document or this Species360 document.

2. *Continue with the Updates. Focus on the animals with status "Alive".*
    a. Focus only on Transaction and Sex Updates. This helps you to know where they are, if they are still alive and what sex they have.

    b. Ignore the other updates for now. Parents only become relevant when you want to start managing the population genetically. However, you first need to know exactly who and where your population is.

Updates

The Updates are the software notifying you of differences between the information in your Studbook, and information in ZIMS for Husbandry. Usually this has two causes:

- New information is available that is not in your studbook yet, for instance the animal has died.
- Information is not matching between the Studbook and Husbandry.

Differences with the institutional data are OK. Updates should only be accepted if this improves the data quality. **The goal is to have correct and reliable studbook data.**

For more information on Updates see this EAZA document, this Species360 document or this Species360 presentation.

3. *Make animals that you will not be getting updates for Lost-To-Follow-Up (LTF)*
    a. Go over the "Institutional Holding" list under "Tools". If you select "Current Holdings", you can see all the holders of Living animals. If there are any non-ZIMS holders on the list, you will need to contact them for updates. If you don't plan on contacting them, record these animals as LTF after the last transaction.

    b. Animals recorded to be held at “PRIVATE”, “UNKNOWN” or “PUBLIC” should be made LTF up after their last transaction, as you don’t know where they are and will not get updates.

c. You should not make animals LTF just because they are transferred out of EAZA. If you get Updates from the new holder it is best to keep the animal in your studbook so you know where it is and the animal not ends back up in your population as “new founder” via a detour. You can use the filters in ZIMS to filter to adjust for your managed population in any analysis and filter these holders out.

4. *Make animals with unrealistic old age Lost-To-Follow-Up (LTF)*
   a. Go over your living animals and sort by age. Are there any impossible old animals on there? Follow up on these by checking for Updates or contacting the holder. If you are unable to find any information on the animal, make them LTF after their last transaction as it is unlikely that they are still alive, but you don’t know when it died and don’t want to fabricate information.

Holders

Even though ZIMS helps with automating information collection, it is still important to contact the holders. Actively ask for missing information and verify things that are unclear or seem strange to you. Holders may have more information on a situation, and even registrars are just human and may make mistakes during data entry.

You're not the only one with this issue, so don't let the work discourage you!
If you have any questions or doubts, please reach out to the EAZA PMC. We are more than happy to help you. If language might be a barrier, let us know, we can help you to get in touch with someone who speaks your language.

Next steps

2. Starting after migration from a SPARKS dataset.

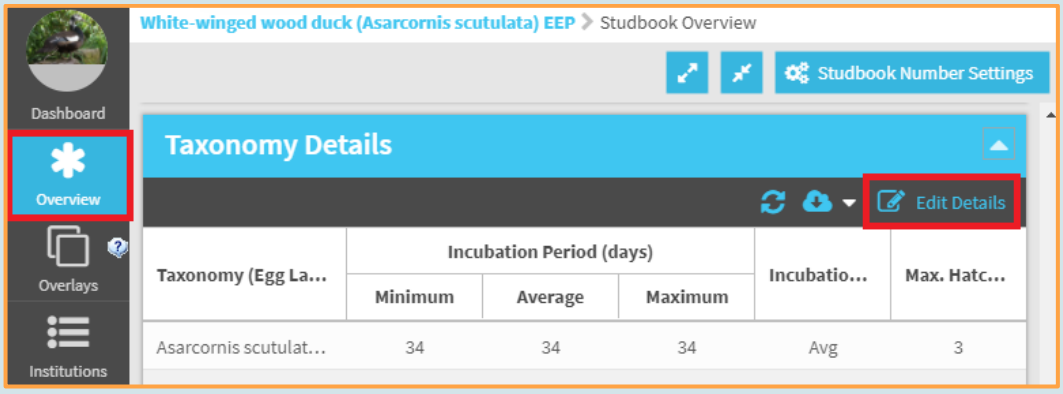
However perfectly maintained a studbook was in SPARKS, it will always need some work after it has migrated to ZIMS. Here we give some tips to help you prioritise the work that needs to be done. We recognise this may be a lot of work and will take some time. However, with small steps it will be manageable. Here we provide a six-step-plan to work on this.

The main thing to keep in mind **after migration is that none of your data has been lost or altered**. The "All Animals" list contains exactly the same information as SPARKS did. The only different information will be in Suggested Animals and Updates, in which ZIMS gives you information from ZIMS for Husbandry to consider.

Set the correct settings

When you start with a new studbook, check the studbook settings in the overview tab of the studbook to see if these are correct. The gestation/incubation period is used by the software to notify you about possible errors. You can edit this yourself by selecting "Edit Details".
The taxonomy tells the software which taxonomies should be part of the studbook. If your studbook includes subspecies, then these should be added to the taxonomies. Please e-mail the EAZA PMC to add any taxonomies to your studbook.
If you are uncertain about the gestation/incubation period of you species, the Animal Diversity Web may be a helpful tool. To learn more about the importance of taxonomy in ZIMS for Studbook, you can read this document from Species360.

Whilst working in the overview, it is advised to go over the "Description", "Species Notes" and "Conventions/Assumptions" section of the Basic Information. Here you can see if there is anything to take into consideration when working on the studbook.



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Linking and updating the living animals

When you start in ZIMS after migration, your priority is to first work on the living animals. You want to be able to receive information on these in ZIMS via the Updates.

1. *Start with the Suggested Animals List. Link the records that have not yet been linked.*
    a. During migration, ZIMS has tried to link the records in ZIMS for Husbandry to your Studbook based on matching information (e.g. Local ID). If an individual is linked, it will have a GAN (Global Accession Number) in its records. However, there are always some animals for which the records could not be linked due to missing or conflicting information. If animals are not linked, you will not get updates.

b. Filter the Suggested Animals list on possible matches. Select the GAN of the record you would like to link. Go over the information of the Suggested link. If you are confident that this is indeed the same animal, link the records. You can use "Animal Comparison" under "Tools" to compare studbook records and husbandry records with each other if you would like more details.

c. If the number of animals on the Suggested Animals list is high, we recommend starting with the living individuals first. By linking the records, you will receive updates if anything changes in the Husbandry record.

Suggested Animals

The Suggested Animals is list of suggestions from ZIMS of records in Husbandry that may need to be part of your studbook. There are generally three reasons why a record shows up on this list:

- The animal is not yet included in your studbook. It may be new-born, or a recently entered historical record.
- The animal is already in your studbook, but not yet linked to their ZIMS for Husbandry record. You should link the two records.
- The animal is already in your studbook and is also already linked, but it has multiple records in ZIMS for Husbandry. If a record is indeed a duplicate in ZIMS for Husbandry, send an e-mail to Species360 (support@species360.org) with the request to merge the two records. If you come across an animal with a possible double record, you can use "Animal Comparison" under "Tools" to compare studbook records and husbandry records with each other to see if they match.

For more information on Suggested Animals see this EAZA document or this Species360 document.

2. *Link the Suggested Animals List records without Suggested Match to their corresponding Studbook individual.*
    a. Go over your Living Animal list. Sort it on "GAN" to easily see which animals have not yet been linked to a ZIMS for Husbandry record. See if you can link these with records from the Suggested animals list.

    b. You can use "Animal Comparison" under "Tools" to compare studbook records and husbandry records with each other if you would like more details.

    c. Note that individuals that are kept at Holders that do not use ZIMS, these may not have records in ZIMS for Studbooks. Go over the "Institutional Holding" list under "Tools" which of your holders are not a ZIMS member.

3. *Add records of new individuals that need to be in your studbook from the Suggested Animals List.*
    a. Only do this for the living individuals for which you are certain that they are not yet included in your studbook. Ignore the dead animals for now. These animals will only become relevant when you would like to analyse your population demographically and genetically.

    b. Avoid adding duplicates as much as possible. Animals might have double records in ZIMS for Husbandry. Sometimes an institution has created a new record after a transfer, rather than updating the existing record. This occurs especially in historic records, as institutions have digitalised their records without checking if the animal was already on ZIMS. If you come across a possible duplicate, you can use "Animal Comparison" under "Tools" to compare studbook records and husbandry records with each other to see if they match. If a record is indeed a duplicate in ZIMS for Husbandry, send an e-mail to Species360 (support@species360.org) with the request to merge the two records.

4. *Continue with the Updates.*
    a. Start with the animals with status "Alive". Focus only on Transaction and Sex Updates first. This helps you to know where your living animals are, if they are still alive and what sex they have.

    b. Check the Transaction Updates for the animals with the status “Undetermined (Lost to follow up)”. ZIMS might have updates on these animals if the institution that received the animal has added information to ZIMS for Husbandry.

    c. Ignore the other Updates for now. Parents only become relevant when you want to start managing the population genetically.

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The Updates are the software notifying you of differences between the information in your Studbook, and information in ZIMS for Husbandry. Usually this has two causes:

- New information is available that is not in your studbook yet, for instance the animal has died.
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Differences with the institutional data are OK. Updates should only be accepted if this improves the data quality. **The goal is to have correct and reliable studbook data.**

For more information on Updates see this EAZA document, this Species360 document or this Species360 presentation.

5. *Make animals that you will not be getting updates for Lost-To-Follow-Up (LTF)*
    a. Go over the "Institutional Holding" list under "Tools". If you select "Current Holdings", you can see all the holders of Living animals. If there are any non-ZIMS holders on the list, you will need to contact them for updates the old-fashioned way. If you don't plan on contacting them, record these animals as LTF after the last transaction.

    b. Animals recorded to be held at “PRIVATE”, “UNKNOWN” or “PUBLIC” should be made LTF up after their last transaction, as you don’t know where they are and will not get updates.

    c. You should not make animals LTF just because they are transferred out of EAZA. If you get Updates from the new holder it is best to keep the animal in your studbook so you know where it is and the animal not ends back up in your population as “new founder” via a detour. You can use the filters in ZIMS to filter to adjust for your managed population in any analysis and filter these holders out.

6. *Make animals with unrealistic old age Lost-To-Follow-Up (LTF)*
    d. Go over your living animals and sort by age. Are there any impossible old animals on there? Follow up on these by checking for Updates or contacting the holder. If you are unable to find any information on the animal, make them LTF after their last transaction as it is unlikely that they are still alive, but you don’t know when it died and don’t want to fabricate information.

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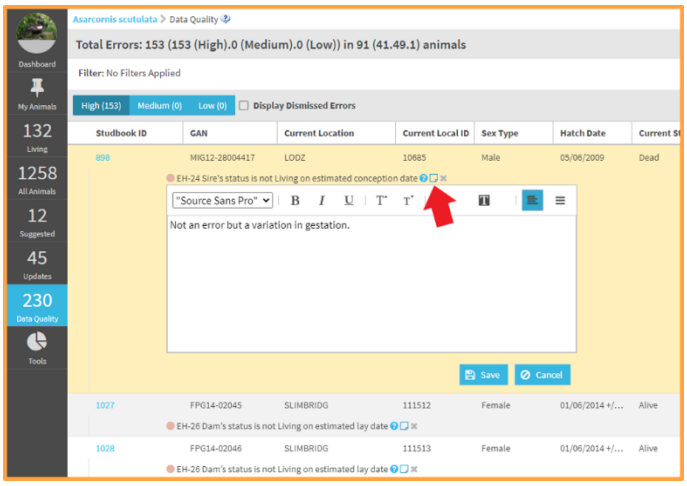
Data Quality Errors

The Data Quality tool helps you by pointing out missing or conflicting data in your studbook. These may affect your analysis. Therefore, it is important to solve these issues as much as possible, before performing any analysis. When working on the errors in your studbook start with the High errors, as these are likely to impact the analysis of your data. For help with solving the errors you can download the EAZA Guideline - Solving Data Quality Errors. We would advise you to keep this document at hand when you work on your Data Quality errors.

Sometimes, errors flagged by ZIMS for Studbooks are not actual errors. For instance, in case of artificial insemination it is correct that the sire and dam are not at the same location at the time of conception. If this happens, ZIMS allows you to dismiss the error. By clicking on the "x" next to the error, the error will be hidden and disappear from the "Total Errors". When you dismiss an error, you should **always create a note** why you dismissed it. In this way, if you ever retire from your studbook, it will be clear to the next coordinator why you made the decision to dismiss.



Always leave a note when dismissing errors.

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Next steps

3. Updating an existing studbook

In a perfect world, each studbook is always fully updated. Unfortunately, the world is not perfect and life happens. Therefore it may occur that you will have to start working on an outdated studbook.
Here we give some tips to help you prioritise the work that needs to be done. We recognise this may be a lot of work and will take some time, depending on the level of outdatedness and size of the studbook. However, with small steps it will be manageable.
If your studbook was originally a SPARKS data-set, we would advise to go to Starting after migration from a SPARKS dataset after this chapter.

Set the correct settings

When you start with a new studbook, check the studbook settings in the overview tab of the studbook to see if these are correct. The gestation/incubation period is used by the software to notify you about possible errors. You can edit this yourself by selecting “Edit Details”.
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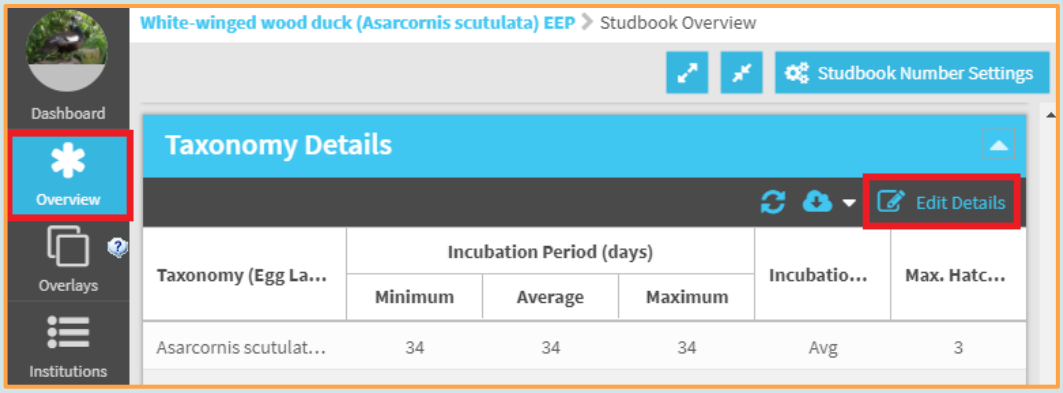

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Updating the population

When you start working on the records in your studbook, your priority is to make sure you are able to manage the living animals. You want to know who is where within EAZA. To do so, you need your records to be up to date. The first step in updating an outdated studbook, is to know how outdated it is. If you do not know, there are some steps that can help you get a general idea.

1. *Find out how outdated your studbook is.*
    a. The Currentness Date may give you a clue, so start to look at that. However, experience learns that this date is not always correct or registered.

    b. Another way is to look at the birthday of the last-born animal in the “All Animals” list. If no animals have a birthday in the year 2018 or later, it is likely that the studbook has last

been updated somewhere in 2017. Of course, this is unless your species is a difficult breeder (looking at you, Hornbill TAG).

2. *Start with the Suggested Animals List. Link the records that have not yet been linked.*
    a. During migration, ZIMS has tried to link the records in ZIMS for Husbandry to your Studbook based on matching information (e.g. Local ID). If an individual is linked, it will have a GAN (Global Accession Number) in its records. However, there are always some animals for which the records could not be linked due to missing or conflicting information. If animals are not linked, you will not get updates.

    b. Filter the Suggested Animals list on possible matches. Select the GAN of the record you would like to link. Go over the information of the Suggested link. If you are confident that this is indeed the same animal, link the records. You can use "Animal Comparison" under "Tools" to compare studbook records and husbandry records with each other if you would like more details.

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4. *Add records of new individuals that need to be in your studbook from the Suggested Animals List.*
    a. Knowing when the studbook was last updated will help you with this. If you know that the studbook was not updated since 2017, any animal on the Suggested animals list with

a birth date in 2018 or later can be added as a new individual. Start with the living individuals.

b. For individuals with a birthday before this date, you should only add them as new individuals to the studbook if you are certain that they are not yet included in your studbook. Ignore the dead animals for now. These animals will only become relevant when you would like to analyse your population demographically and genetically.

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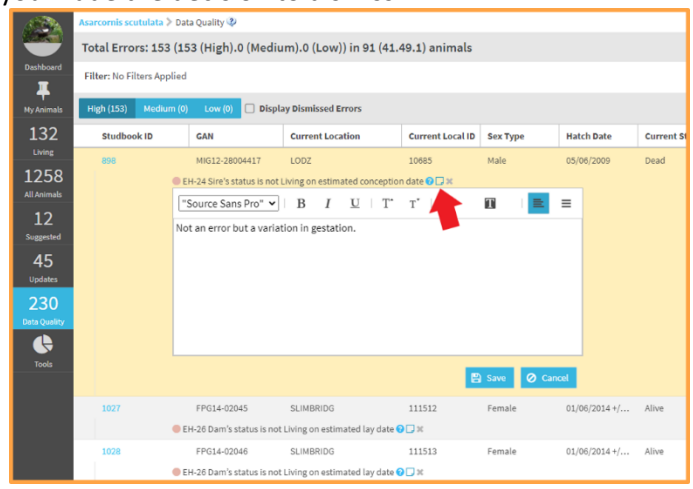

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Next steps

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After you have finished the initial cleaning up of your studbook, it can be tempting to want to solve all Data Quality Errors, Updates and/or Suggested animals. However, in the starting phase of your studbook it may be better to leave those until you have the opportunity to follow up on these before adding or adjusting information. **The end goal is to have correct data, not to bring all the errors down to zero.**

Furthermore, as most studbook keepers have limited time available to work on the studbook, it is important to determine what the needs are for your studbook to avoid unnecessary work:

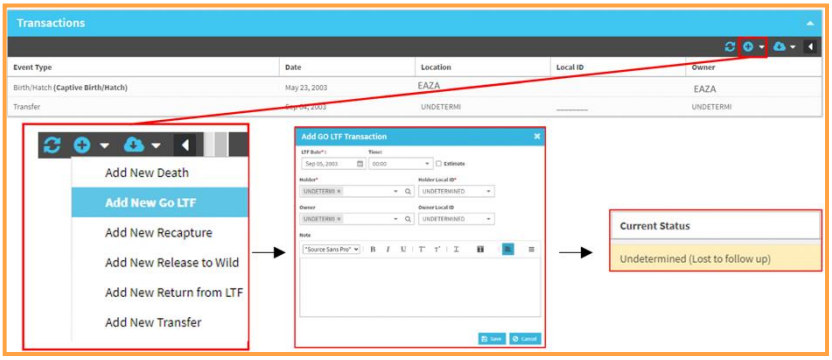
- Is the studbook meant to only track the population? For instance, to monitor or even phase out a population? Then you can continue with keeping the living animals up to date but no further work is needed.
- Do you want to use the studbook for demographic analysis? For instance, to see what the survival of your species is at different ages? Then you will need to add dead animals from the Suggested animals list to your studbook as well in order to analyse their data.
- Do you want to manage your studbook genetically? Then you will need to work on the parentage Updates in your studbook and will need to add all individuals to your studbook that are part of the pedigree of your living population.

Generally, the purpose of the studbook and the needs for the species should be clear from the RCP outcome. Please contact the EAZA PMC to discuss the next steps for your studbook. In case of any questions, contact information of the Population Management Centre can be found on the EAZA Member Area under EEO Staff contacts. We are happy to talk with you.

Appendix I

Making animals Lost-to-Follow-up (LTF)

Adding a “GO LTF” transaction notifies ZIMS that we do not have any further information on this animal. A LTF animals is removed from the living animals list since the status of this animal is unknown. When you want to add a LTF transaction you should add it the day after the last transfer. This indicates you know the animal was moved, but you have no information after that. It might have died the next day, it might have lived a long and happy life with many offspring. We don’t know. Copy the Holder and Owner name + ID’s from the last transaction when it went to a non-ZIMS institute. When the Local ID of the last transaction is blank use “Undetermined”.

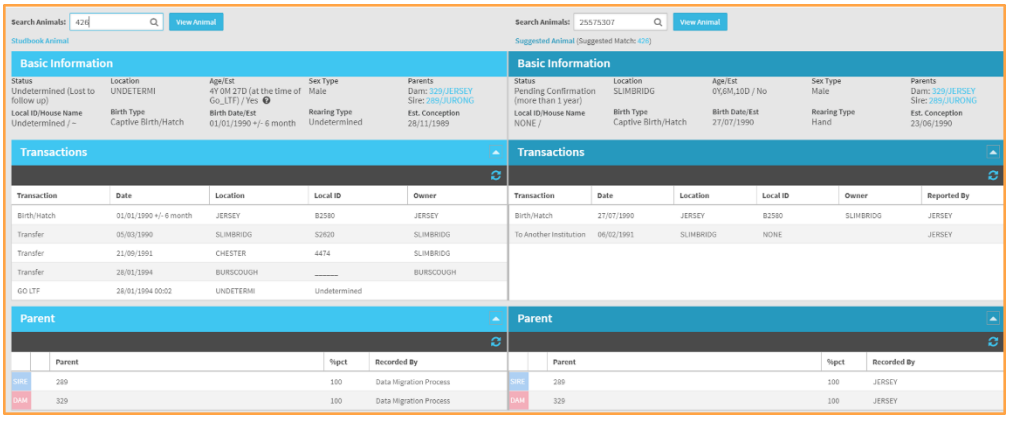


Adding a "Go LTF" transaction to an animal record

Using the Animal Comparison Tool

Beside comparing two Studbook Animals to each other, you can also compare two GANs (from Husbandry) or a Studbook Animal and a GAN. When comparing a Husbandry record (GAN) with a Studbook record (Studbook ID), the Husbandry record displays in dark blue with “Suggested Animal” text. The Studbook record displays in light blue with “Studbook Animal” text.

If ZIMS has a suggested Match for your Husbandry record, this will be mentioned at the top of the Husbandry record. When you enter a GAN that is already linked to a studbook record, the corresponding record will automatically appear in the comparison. If you click "View Animal" for a Husbandry record that has not been linked yet, it will direct you to the record from the Suggested Animals list (allowing you to link it).

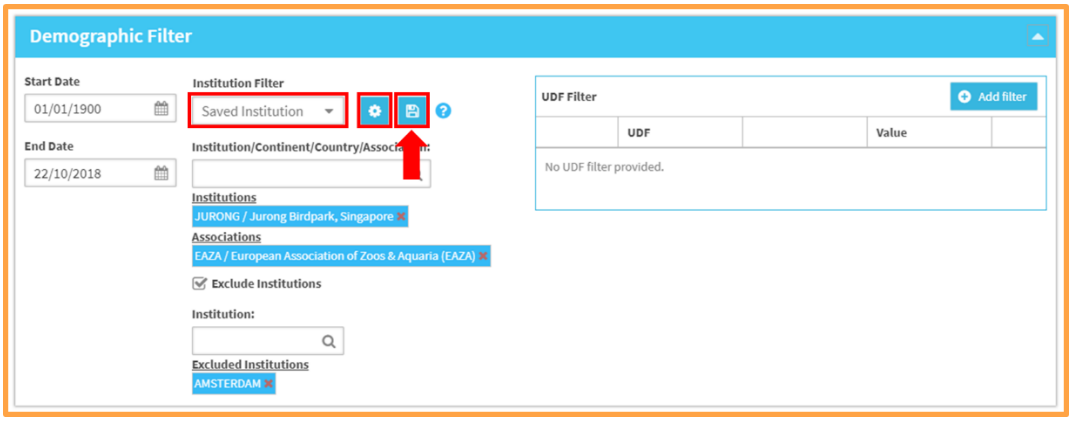


Comparing a Studbook record in light blue and Husbandry record in dark blue.

Creating a custom filter

Especially for programmes with a several non-EAZA participants it can be bothersome to have to re-enter all the institution names of all these participants every time you want to filter for your programme. In order to make your life easier, ZIMS has created the functionality to custom save your selection of institutions. (For SPARKS users, this is the new EAZA FED-file).

You can create a custom filter by selecting institutions for the filter. You can also exclude an institution if necessary. After selecting your scope, select the "Save-icon" and name the new filter. From now on, you can select your filter by selecting "Saved institution". You can also manage your filter, by selecting the "Settings-icon".

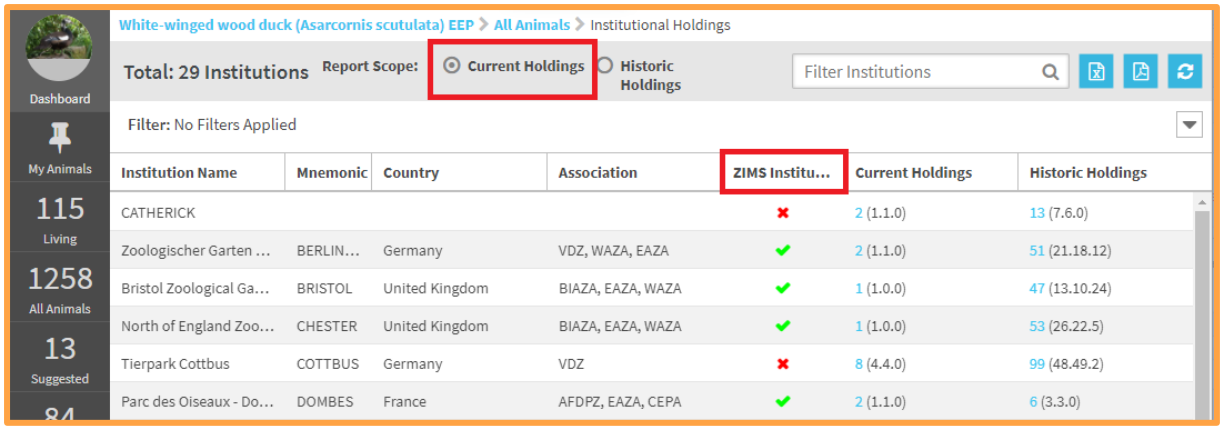


Creating a customised filter in ZIMS for Studbooks

Institutional Holdings

The Institutional Holdings can be very handy tool if you are cleaning up your dataset after migration. Here are some tips and tricks for that:

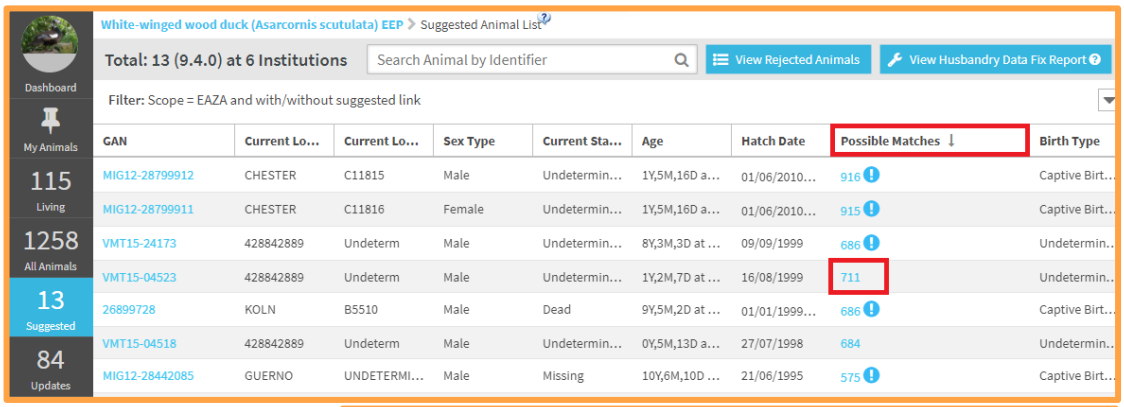
- Use the column “ZIMS institution” to see which holder are member of Species360. If an institution is marked with a red cross, this means they are not a member and therefor that you will not get any updates on the individuals they hold. You will need to contact them for updates. If you don't plan on contacting them, record these animals as LTF after the last transaction.
- By sorting on Mnemonic, you can easily see the local institutions in your studbook, as they do not have a Mnemonic. This can help you identify any duplicate or mistakes in the local institutions. If you spot a suspicious local institution, select the hyperlink to the records and take a look what is going on. There may be some new information available that can help you. (See the example on the right)
- Check the Mnemonics for CIRCUS, DEALER, ESCAPE, PRIVATE, PUBLIC, UNKNOWN, UNDETERMINED or WILD. The number of animals for Current Holdings, so the living animals currently at these locations, should always be 0.
  The reasoning behind this is that these Mnemonics indicate unknown locations, such as unknown private holders or unknown dealers. As you do not know where the animal currently is, you will not be able to get any updates on it. This means the animal should be registered as Lost To Follow up (LTF) after it's last known transaction.
- Check the Institution Names for any extinct (no longer existing) holders. These should no longer hold any living animals.



Using the Institutional Holding tool to manage your living population.

Linking animals

Sort the Suggested Animals list on living individuals with Possible Matches. These possible matches are individuals in your studbook for which the software suspects that they may be the same individual. This should be carefully checked through for each individual before linking.
To link an individual, click on the linking icon on the right side of the record.



The "!" behind a possible match indicates this individual has already been linked. This may indicate three things:

- The individual has two records in Husbandry. If a record is indeed a duplicate in ZIMS for Husbandry, send an e-mail to Species360 (support@species360.org) with the request to merge the two records.
- The animal in your studbook is linked to the wrong Husbandry record. Solve this by unlinking the studbook record and then link it to the correct record.
- The possible match is not correct. Ignore the possible match and link it to the right individual or add this animal as a new individual if it is not in your studbook yet.

Use "Animal Comparison" under "Tools" to compare studbook records and husbandry records with each other to see if they match.