Best Practices in Animal Husbandry and Inventory Records Keeping Using the ZIMS Application

December 2020

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Introduction

This document is meant as an overview of best practices to help animal records keepers create and maintain the best possible animal records using the ZIMS (Zoological Information Management) application. Although some of these practices vary from region to region, there are many commonalities found between them and we have tried to highlight these.

The original 2013 publication contained contributions from:

Sara Brice, Registrar Collections, Taronga Zoo

Clare Collins, Conservation Officer, Banham Zoo; Chair, BIAZA Records Group

Josh Courteau, Training Manager, SPECIES360

Sander Cozijn, SPECIES360 Regional Coordinator, Europe

Cecile Erny, Executive Director, Association Française des Parcs Zoologiques

Tineke Joustra, Registrar, Auckland Zoo

Lynn McDuffie, Animal Records and Regulatory Affairs Manager, Disney's Animal Kingdom/The Seas

Adrienne Miller, SPECIES360 Lead Trainer and Subject Matter Expert

Zak Showell, Research and Conservation Registrar, Twycross Zoo

Deanna Snell, Registrar, Calgary Zoo

Alice Warren, Registrar, Bristol Zoo Gardens; Vice-Chair, BIAZA Records Group

This 2020 publication was reviewed and updated by Adrienne Miller, Species360 Training Content Developer and Hannah Jenkins, Zoological Registrar, Zoological Society of London, Chair EAZA Records Group.

As ZIMS is in a constant state of increasing functionality, this document will be updated as ZIMS improvements can support additional best practices. Please forward any suggestions or additions to training@species360.org for inclusion in future publications.

In this document the ZIMS logo is used to highlight specific ways that ZIMS can help you with these best practices. If a paragraph is in ***bold italics*** and proceeded by the ZIMS logo:

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the information is specific to what ZIMS can do to assist the animal records keeper with the topic.

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Animal Records Overview

Definition of an Animal Record

Without a complete and accurate animal record, population managers cannot make informed recommendations, veterinarians cannot effectively provide treatments, and curators cannot manage husbandry in the best possible way. Animal records are the basis for husbandry and management decisions; as more species are managed regionally and globally, animal records are critical for decisions made by population managers for conservation programs. Your animal records can, and do, have a global impact.

As stated in the Animal Records Procedures document of Zoos South Australia, animal records are ([i]):

> *"…core to the efficient husbandry and management of the animal collections…"*

The Association of Zoos and Aquariums' Institutional Data Management Advisory Group defines an animal record as ([ii]):

> *"Data, regardless of physical form or medium, providing information about individual animals, or samples or parts thereof, or groups of animals"*

Therefore, an animal's record is not only what is entered into their paper or electronic record, but also other documents and electronic files including, but not limited to:

- Transaction documents such as confirmation forms, loan agreements and permits
- Veterinary information such as necropsy reports and the results of testing
- Correspondence regarding the animal or group
- Surveys and questionnaires

Most institutions have found that the integrity of the animal records is maintained best when a single person is identified as responsible for the animal records. Some Regional Associations have this single designation as an accreditation requirement. Multiple staff can contribute to and enter data into a record, but one person should oversee the quality and completeness of the animal records.

Animal records should represent as complete and as accurate a history of the individuals and groups in the institution's collection as is possible. Although not all institutions' animal records are entered into an electronic database (many historical records remain in hard copy only), if the records are accessible then the history should be accurate.

ZIMS

The ZIMS application allows the functionality to maintain and conserve a single, global record for each individual animal or group. This means that an animal record is accessioned into the application only once. Any moves to other institutions create visits within the record. There is no break in the record between institutions and no linking of individual records required, thus creating a less error sensitive records keeping system. Through the External Sharing functionality, ZIMS also allows sharing specific records with

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designated institutions, re-enforcing the idea of the single global record. This sharing provides a full history of the animal. Remember to request records sharing from all previous institutions so this history is complete.

In the beginning of captive animal collections, often the information supplied consisted only of the species, the sex and the type of transaction (collected from the wild, purchased, sold, etc.). But in today's world, this information is insufficient to assist animal and population managers successfully manage their collections. Early animal records were maintained simply to track the institution's collection and there was no need for global sharing of data. But now, with cooperative management of species both regionally and globally, significantly more information is required; a change in an animal record by one institution may highly impact another institution's management of the specimen.

There is a minimum amount of information that needs to be recorded on the animal entity:
- What is it?
    - Individual Animal
    - Group of Animals
    - Egg
    - Fetus
- What species is it?
- What sex is it?
- What was its birth date?
- Who are its parents?
- What is its provenance (origin)?

There is also a minimum amount of information that needs to be recorded on any transactions that have occurred for this specimen:
- What was it?
    - Census change (birth or death)
    - Transaction (acquisition or disposition)
    - Group Transaction (splits or merges)
- Where did it come from or who did it go to?
- What were the terms?
- Where is it physically?
- Who owns it?
- When did this happen?

ZIMS

When Users are creating records within ZIMS, all the above fields are mandatory to assure collection of this minimal information.

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For a complete specimen record there is much more information to include. Some of this information can explain the "why" or "how" a piece of recorded data was entered. For example, an animal was originally sexed as male, but the sex was changed to a female; the "why" for this change may be as important as the actual sex change. Or, a census was recorded on a group; the "how" the census was taken can provide equally valuable information.

ZIMS

For many data entry fields ZIMS has data standards to explain the how or the why. Some examples are taxon determination method, how you took a census, and why a sex was changed.

Creating Good Animal Records

"Zoos and aquariums are guardians of captive wildlife populations; animal records databases are tools that assist animal management staff and population biologists in providing the best possible care for these animals and their respective populations. Accurate and unambiguous data permit informed decisions for conservation and management of the species and specimens in our care." ([iii])

That statement was contained in the foreword to the "Standards for Data Entry and Maintenance of North American Zoo and Aquarium Animal Records Databases." Although the document was developed for North American zoos and aquariums, the statement holds true worldwide, and for any animal record database/application that is being used at any time.

Think Output, not Input

Sometimes it is more important to ask, "What do I want to get out of my animal records?" and not, "What do I want to put into my animal records?" If the information is not easily retrievable, then collecting, recording and storing it provides little benefit. It is this retrieval of data that is used by not only the local institutional collection managers but also by regional and global species population managers.

Maintain the Truth, do not create Fiction

Maintaining the quality (or *Truth*) in your animal records is paramount. Most people do not mean to create *Fiction* in their records but it can happen:

- Data Omission
  - o Sometimes the information is recorded, sometimes it is not. This will create an incomplete and confusing view of what happened. This may be due to incomplete training of the person submitting the data or the person doing the data entry.
- Data Entry Errors
  - o The person entering the data misunderstood or misinterpreted the information, made an entry mistake such as transposing numbers or letters or was inconsistent with how the data was entered.

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- Entry of Incorrect Data
    - Making assumptions (example: the silverback gorilla must be the sire of this offspring even though there are other adult males in the troop)
    - Recording "known" information for "unknown" data (example: since the giraffe was in the 1948 inventory but it wasn't in the 1949 inventory, it must have died in 1948)

Future users of this data will take the entry as the *Truth* which may significantly impact an animal or population managers' ability to make appropriate decisions.

Regional Association Accreditation Requirements

Many countries have zoo and aquarium associations that offer accreditation for those institutions meeting specific requirements. Many of these associations have requirements for the animal records that must be met before accreditation can be achieved. There are many commonalities between regions as to what best records requirements are to meet these accreditation goals. ZIMS can help you with most of these.

- Inventories, or stock records, are compiled at least once a year and animals in and out on loan noted.
- It is very important that animals are identifiable, preferably with a physical identifier, and have ID numbers. Methods used to identify individuals must be noted.
- If individually identifiable the animal is recorded as an individual. If animals are not individually identifiable then group management is encouraged so as not to create fiction. Some require a statement as to how group records are maintained.
- Many encourage the use of transponders and some are very specific about standardized locations for transponders and restrictions on their reuse.
- Duplication of animal records is a common requirement. Using generally ZIMS meets this requirement for the standard animal information. Permits, titles, agreement forms etc. may still need to be duplicated.
- Protection of your records is very important. Off-site storage of duplicate paper records and electronic backups is encouraged. Both your original records and duplicates must be protected from hazards such as fires and floods.
- Records should be current and up to date.
- Many encourage the designation of a single records person as contact and to oversee the records and this person should have the proper training.
- The submission of your institutional data to studbooks and management plans is a priority. If your studbook is using ZIMS there is no need for data submission to the Studbook Keeper.
- Recommendations for the retention of keeper dailies are generally a minimum of 5 years.
- Animal welfare is routinely assessed.
- Water quality is monitored, and allowable parameters are identified. Chemical additions are tracked.
- Feeding records are maintained.

Contact your Regional Association for specific requirements regarding animal records.

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Procedures Document

To help you make sure that you follow the best practices, creating an animal records Procedures Document is a good idea. What you include in the document will depend on your institution. Some topics to consider including in this document are:

Keeper Reports and Direct Data Entry

These reports are a primary source of information, so your procedures regarding these reports are especially important. With the roll out of Provisional data entry (data entered by someone that must be Approved before it becomes a part of the true ZIMS database), many institutions have moved to direct data entry by their staff either at the end of each day, or in real time via portable recording devices. Recent new functionality has been designed to support viewing and data entry mobile devices (examples are the Husbandry Log Templates and the Care and Welfare module).

If you are still using Keeper Reports, some information that you may want to include in your procedures document is:

- Who is responsible for completing and submitting these reports? Is the Lead Keeper in the area responsible? Or are all individual keepers responsible for recording their own information?
- Do you have specific formats and recording orders for identifying the animal or group being referenced? For example: Species (common or taxonomic name?), Sex, Local ID, Other Identifier).
- What information should be recorded? Obviously animal data is recorded here, but do you want maintenance information here, or elsewhere? Are there specific logs for training? Standard information collected via keeper daily reports is:
  - Changes in the animal collection (births, deaths, acquisitions and dispositions including laying of eggs and spawn)
  - Parental identification
  - Additions or deletions of identifiers, both physical and logical
  - Behaviors, both normal and abnormal
  - Enrichment and training
  - Medical treatments and procedures
  - Reproductive behavior and contraception
  - Animal moves within the facility
  - Animal introductions
  - Diet and appetite changes
  - Weights and Lengths
  - Sex changes or updates
  - Changes in physical appearance
- Who receives these reports? Is one paper copy or electronic file sent to the records person who then distributes it, or are there multiple copies or electronic files that are sent to appropriate staff members and the records person does not need to distribute the information?

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- Include the desired timeline for data entry from keeper reports into your records keeping application. Do you want to have a census change recorded within 24-48 hours after it occurs? Can you wait for additional information such as measurements and observations?
- How long do the hard copies need to be maintained in your facility? What are the paper records policies of your facility or city/county/parish/state legislative requirements for archiving business records?

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As more and more institutions move from having a single person doing all the data entry to allowing various staff members to enter their own information into ZIMS, a daily report may quickly become a thing of the past. ZIMS has two ways of monitoring what is being entered into the application - an Activity Report and Data Entry Monitoring (regular entries and Provisional entries). The Activity Report allows staff to see what has been recorded over a given time period at various levels of detail. The power of Transaction Monitoring is that it allows you to edit what was recorded or actually "Roll back" an entry that was incorrect.

If you are allowing direct data entry in to ZIMS by other Staff members, be it full entry or Provisional, you still need to provide guidelines to follow:
- What information will be entered by what Staff member? For example, Keepers may enter weights, lengths and notes but Curators will enter enclosure moves and identifier changes and the Registrar will enter Transactions.
- What is the timeline for data entry?
- Dos and Don'ts for recording Notes. Do you allow abbreviations and acronyms? When do you use the "Include Local IDs in Notes" option? Which Note Types and Sub-types are approved? Will you use Observations when appropriate?
- What information should be captured to ensure standardized date entries. For example, if one Keeper records when the animals do not shift in for the night, but the other Keeper does not, the records become misleading.

Maintaining the Database
You should also include whose responsibility it is to maintain the database:
- For institutions with one records person, he/she is usually charged with maintaining the database.
- ZIMS allows multiple people to enter data. If multiple people are involved, it is important for everyone to know his/her responsibilities. If your institution allows multiple people to enter data, it is imperative to know who is responsible for entering what data and when. Information can be lost if one person believes another person is responsible for maintaining that data.
- Maintaining the quality of the data is also critical. Indicate who is responsible for data quality. Although many people may be responsible for data entry, one person should be responsible for reviewing the overall quality of the data.
- How data is disseminated is also important. Do you create a combined report that is distributed, or do

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staff members have access to ZIMS so they can keep up with changes on their own?

Transaction Flow

One place where problems can occur is within the flow of your acquisitions and dispositions.

- Clearly define the role of every staff member who participates in transactions.
- Define which department is responsible for providing what document or performing which actions.
- Determine which department is responsible for collating information and paperwork prior to receiving or sending a specimen or group.
- Determine a method to keep track of the progression of the transactions. Many institutions have white erase boards that staff can reference, and others have shared electronic documents. Make sure that everyone who has a role to fill in the transaction process also has access to this information.

Filing

Filing has gone beyond how you maintain your paperwork; in this electronic age you also need to think about how your electronic files are maintained.

- What is the main system of filing your documents? The following are some filing order suggestions:
  - By taxonomy: specific taxonomies, and often individuals within each taxonomy, have their own record and any document associated with it is contained within the file.
  - By institution: organized by transactions with specific institutions.
  - By document type: similar documents are together - all confirmation documents are together, breeding loans are together and health certificates are together.
  - By numeric order: by GAN or Local Accession Number (Local ID), regardless of taxonomy or institution
- Which documents go into each file?
- What documents need to be duplicated and filed in separate locations? Permits and original breeding loan agreements are often copied, and the originals stored in a secure location. Is it acceptable by your laws governing archive business records to have scanned copies of permits replacing the hard copies?
- How are your electronic files organized? This is especially important for institutions that share files on a network.
- Who has access to the electronic and paper files? Is access limited to records staff or can other staff members access your files, either the paper or the electronic versions? Especially for institutions that are networked, how you organize your electronic files is very important so your staff can find what they need. Providing clear policies on digital file access and sharing is critical as documents can be easily duplicated and sent outside your institution when they are maintained in an electronic format.

ZIMS

By properly creating your Roles and correctly assigning them to your various ZIMS Users, who has access to what information can be carefully controlled. In ZIMS you can see which of your users are currently logged into ZIMS (sessions) and you have the ability to only permit one active session per user. Additionally, you are able to restrict use of ZIMS to only permitted IP addresses; this allows you to ensure that staff members are

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not accessing files from outside of your institution approved IP address such as their home or a coffee shop with internet.

Permits and Licenses

Permit documents are some of the critical and vital documents that need to be duplicated for accreditation requirements or disaster preparedness. They are critical because they support the legality of your animal collection, including your authorization to possess and the acquisition or disposition of protected species. Permits are an integral part of the animal's record and permits should be included as a topic in your procedures document. You should include who prepares the permit, who signs permits and where original permits are stored. When applying for a permit it is important to know what media or format your regulatory agencies will accept as far as documentation and the submission of the application itself. More and more agencies are accepting electronic format but there are many where a hard copy and actual signature are required. Wildlife laws and regulations are under constant review and interpretation. Attempting to understand what activities require which permits can be an overwhelming responsibility, but remember, you are not alone. The permit process should be a team effort and you should not hesitate to ask questions if you don't understand. See the section on Animal Records Groups and Associations to help find some organizations that can help you.

ZIMS

ZIMS can help you track your permits through the permits grid in the My Institution module. These permits can be assigned to animals, enclosures, staff and other institutions should you have sub-permitees involved.

Records Retention

Another topic that may be part of your procedures document, or a standalone document, is your records retention schedule.

- Will you keep your keeper dailies forever, or only five to seven years?
- A retention schedule for your other paper documents is also encouraged.
- Do not forget your electronic files. As more institutions go paperless more documents are stored electronically and a retention schedule for them must also be determined.
- Records retention policies can vary from city to city and certainly country to country, so you need to check to see if your region has any that you need to follow. You may not have a choice in the matter.
- Animal records should be considered "vital" records and some regions/associations require these to be retained indefinitely. This does not mean the paper copy (like keeper reports) must be retained indefinitely. As long the information from the paper copy has been recorded electronically then the paper could be destroyed, and the electronic copy would be the indefinite copy.

Document Overview

You may want to include an overview of what specific documents are used for what purpose and function they serve. Document titles may be very similar, and it may not be clear to all which is the correct one to use. A transaction confirmation form usually does not cover the distribution of offspring; most institutions have

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separate documents for that information. A transaction confirmation form for a transaction with another accredited facility may be very different than a confirmation form with a local dealer. Where these documents are located, hard copies or electronic, will also help save time spent searching for them.

Disaster Preparedness

A very important part of your Procedures Document should include information on Disaster Preparedness. Some institutions develop a standalone document for preparing for disasters. Obviously, institutions that are in hurricane, earthquake or flood prone areas should make this a high priority, but no institution is exempt from the possibility of a disaster. It may not be environmental but may be medical or man-made. Do not procrastinate and wait until a disaster is imminent to begin preparation for emergencies.

Recommendations to include in this document are:
- Identify which are your critical and vital records that need to be protected. Ensure you have plans that include both your paper and electronic documents.
- Have provisions for protecting these critical and vital records. Will they be moved to another location or simply placed in a more protected area within your facility?
- Outline preventative measures to minimize risk to these records. Perhaps you can change some standard procedures so that you do not have to take extreme actions if a potential disaster looms.
- Provide a recovery plan should any of these records become damaged despite your careful preparations.
- Create this document when you are not in disaster mode. When you find yourself in times of trouble you may not recognize all the details that are important. By creating your readiness plan when you are totally calm and looking at things clearly, you are more likely to include all vested parties in the preparedness planning process.

Often a checklist of steps to take that you or staff can follow and indicate what actions have been taken is very helpful. For example, for an approaching hurricane you can record what needs to be done 2 days before landfall, 1 day before landfall, and when landfall is imminent. Don't forget to include the steps needed after the disaster has passed.

ZIMS

Because ZIMS is internet based and securely backed up, the need to protect your database in case of an emergency is already covered. Prior to a disaster you may want to create ZIMS access for a trusted person outside your institution so even if you or your staff cannot enter data, someone else may be able to do so in the interim.

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Best Practices for the Record Keeper

Know Your Documents

One very important detail that cannot be checked off as an action taken during disaster preparedness or written as part of a procedures document is to know your documents. Many documents may look alike; it is your responsibility to ensure you are using the correct document. Be sure that you double check that you are also using the most current version of your documentation. If you are responsible for maintaining documents/forms for your institution, remember to edit the version number or the "last date updated" field as you revise documents.

It is also your responsibility to read your documents. Mistakes can go unnoticed if you just receive the forms, file them or send them along for a manager's signature. Although you might have agreed to something over the phone, this does not mean that this is the way the final documentation was written. Many institutions have lawyers who read and approve, or disapprove, of any documents before your facility signs them. In many other facilities it falls to the records person to confirm that the documents are correct and that internal institutional approvals have been obtained. Make sure you protect yourself and your institution.

Ensure all documents reference the species and local ID, GAN or other identifier such as a transponder that the document is applicable to as well as a relevant date, preferably with month written out to avoid confusion. Papers can get mixed up and it may not be easy to determine what piece of paper goes with what transaction or into what file if they get out of order.

Permits and Licenses

Permits and Licenses are a very important topic where best practices must be adhered to. Some best practices for completing an application include:
- Check the application date. Applications are often updated and submitting an expired application may cause it to be delayed or rejected.
- Answer all questions completely. It is often a good idea to have a second person review the application for clarity.
- If a question is not relevant to your situation it is recommended to briefly explain why it is not rather than simply entering "Not Applicable".
- Make sure the appropriate person signs the application.
- Include contact information for who completed the permit should there be are questions from the reviewers. If they send questions to the person who signed it instead that may cause a delay.
- If the species is part of a managed program include a letter of support from the species manager.
- Give yourself enough time before you need the permit. The time required for processing varies greatly by region and type of permit.

You should not just receive your permits and file them. It is very important that you read them carefully and check the following:
- Are the effective and expiration dates correct?
- Are there any special conditions you must abide by?

- Are there any reporting requirements and when are they due?
- Is the contact information correct and up to date?
- Was it signed by the issuing authority?

ZIMS

Once you have recorded your permits into ZIMS you can assign them to animals, enclosures, staff and other institutions (should there be sub-permittees). You can also search by Expiration date to make sure you stay up to date on permit renewal deadlines. You can also add an Enclosure or Animal Alert to your calendar to remind you before a report or renewal is due.

Communication

With the various people and organizations that a records person must deal with, effective communication is key to success. Externally you communicate with other institutions, regulatory agencies, shippers and transporters. Internally, you communicate with staff members, not only to get the best information into the records, but also to get it disseminated most effectively. Sometimes people just do not communicate. Either they do not know how or perhaps they feel it is not required. Often there is some communication but not enough to allow us to successfully proceed with the job at hand.

In the age of email, texting and instant messaging, sometimes the overload of communication makes us just as ineffective as having too little or no communication. If possible, establish a communication flow. If a keeper tells you that they wish to disposition an animal do you start the paperwork? Do you have a clear outline of how a transaction should begin? Does your facility have a plan for its preferred method of communicating in-house? Does everyone have access to the information that they need?

Even if communication is perfect there may be conflicts that arise, both externally between institutions, and internally between staff members. Providing a way to resolve conflicts is important. Animal Ownership is a common external conflict. Hopefully you can work together to determine who the actual owner is and correct the record to reflect this mutual agreement. It is wise to establish contractual agreements regarding animal ownership and who is responsible for costs prior to animal transfers taking place. SPECIES360 can be contacted to help resolve ownership issues by assisting with interpretation of the existing records.

ZIMS

The Species360 Post Office in ZIMS helps with communication between Species360 institutions regarding transactions and ownership changes. These Post Office messages are created by the application and you cannot use the Post Office to send messages back and forth with other institutions. If it is your responsibility to keep track of the Post Office messages do not neglect to do so as you may miss an important notification. You will continue to receive reminders that you have messages until you have marked it as read, checked the "Done" box, or moved it into your trash for deletion.

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Time Management – Quantity versus Quality

We all want our records to be the very best possible, but with the rise in multi-tasking and with an overload of data, we sometimes need to decide what information we are going to enter and what we are not. Accuracy, or **quality**, is of utmost importance even when you have a limited amount of time. Many records people serve multiple roles and records keeping is only a small part of their responsibilities. Records staff have little time to spare and an institution's commitment to best practices in records management can help to ensure the staff are provided sufficient time to maintain quality in institutional records.

Perhaps, as part of your records procedures, you can create a list of priority items for data entry, and proposed timelines for entering the data. An example would be if you are entering historical entries, do you start with the first piece of paper you find or do you start with animals that are part of a managed program? Or you may want to start with the ancestors of your currently held or owned animals. Taking a moment to produce a plan of attack will ultimately save you time.

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The ability for multiple people to enter data into ZIMS can help you manage your time. Once properly trained, keepers could enter their own animal weights/lengths, notes and enclosure moves, curators can keep the Available Animal and Species Wanted updated and aquarists can record water quality measurements. The entire weight of data entry no longer has to fall on the shoulders of one person, although one person should oversee the quality of the database entries. Because of this functionality, the Role of the Registrar may be transitioning from date entry to more one of data management.

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Best Practices for General Data Entry

Standardization – Use of Data Standards

Over the years, in the analysis of over 2.5 million animal records submitted to SPECIES360, it has become apparent that one institution may enter information differently than another when recording a similar event. Even individuals within the same facility might enter information differently than a colleague. This makes retrieval of the data very difficult as it might be entered differently in similar circumstances. Although most professionals agree that standardization is very important, the challenge comes when an institution wants to establish standards, but only if the standards that are set for everyone are the ones presently used by them.

ZIMS

ZIMS has helped with the standardization of data by using some 300 Data Standards developed by Subject Matter Exports worldwide.

ZIMS presents these Data Standards via drop down lists for Users to select from. These lists ensure that we are all selecting from identical choices, therefore making data retrieval easier. There are three types of Data Standard lists dependent on the functionality required by the field:
- Single select – most data standards allow you to make a single selection from the list
- Multiple select – these standards allow you to select as many terms as you want from the list. Multiple Select Data Standards have boxes to the left of the terms that you can check. Two examples are Reason for Training and Relevant Death Information.
- Cascading – these lists expand and allow you to make a selection at any point, from very generic terms to very specific terms. Two examples are Component Type and Egg Result.

Data Standard lists are not static. If you believe there are any terms missing, report these to support@Species360.org. You will need to provide:
- The screen that the field is on
- The title of the field
- The term you wish to be added
- The definition of the new term to be added
- The estimated frequency of use of the new term to be added by your institution and others

For any free text data entry fields, it is a good idea to develop a list of keywords to make searches easier. Also, by standardizing the order that data is entered into documents or databases, it can make it easier to find what you are looking for when it is time to build reports or complete searches.

When Information is Not Known

Complete and unambiguous data in every field is the perfect world for a perfect animal record; however, the answer to every field may not always be known. DO NOT create fiction by filling in information for fields where

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you do not know the answer. Recording incorrect data results in a bigger negative impact to the record by influencing decisions made using the incorrect data than simply recording unknown information.

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ZIMS allows you to differentiate between information that is unknown at the time of data entry but which you expect to find later versus information researched fully and will never be known:

- ***UNDETERMINED: The answer is not known at this time but may be in the future***
- ***INDETERMINATE: The answer is not known, significant efforts have been made to find the answer but it will never be known (HINT: "I" = Impossible).***

Changing Your Records

There are three main reasons why you may need to change a record that you have entered:

- You simply made a mistake in the data entry
    - If you discover the error soon after entering it, you can simply change it with no other impact on your records. However, if the incorrect entry has been in the record for a while, especially if shared with other institutions or studbook keepers, you should follow the three Rules below and notify any impacted parties.
- Another institution has provided you with data that differs from yours
    - In this situation it is very important that you DO NOT change your data just because someone else said to. You must be confident that the information is correct. Common examples of these types of data changes are sexing (animals are usually easier to sex as they mature), parentage (perhaps genetic testing was done) and taxonomy. There may be times when you just do not agree, and your records should remain as you best interpret them.
- You have found new information that may affect the record you entered
    - Perhaps the transaction paperwork finally reaches you and some of the information is different than you recorded.

When changing records there are three Rules to follow and this information can be captured in a Note entry. Use Note Type of General and Note Sub-type of Data Change or use a keyword of Data Change and select the appropriate Note Type and Sub-type. Try to be consistent with which approach you use to make finding the data changes easier at a later date.:

- Record what the record was before it was changed, including the date of the original entry.
- Record what it was changed to
- Record the reason for the change.

If other institutions or studbooks are impacted by the change they should be notified.

When editing Sex or Taxonomy you may want to keep the original record intact and record a Change Event instead of editing the original entry. This allows you to see that an animal was managed as a different Sex or Taxonomy for a period of time.

ZIMS

ZIMS has the ability to "Undo" your data entry error if discovered immediately. You can "Undo Accession Transaction" if you made an error during the Accessioning process and this will take you back to the Accession screen to make edits. You also have 10 seconds to "Undo" almost all other data entry once saved. For errors found at a later date (up to three months) you can chose to "Undo Selected (Roll back)" any data entry using Data Entry Monitoring. This should only be used when it is a definite data entry error rather than a confirmation of new information.

ZIMS

If you have data that conflicts with another institution it will display in red so that you are aware of the discrepancy between your records and another institution's records.

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Transactions (Other Than Births and Deaths)

Accessions, Visits and Events

Animals are accessioned only once into the ZIMS application. It usually falls to the first holder (or SPECIES360 member) of the animal to create the initial accession. After the initial record is created, all subsequent moves between facilities create Visits instead of new accessions. A change in entity type creates an Event.

Accessioning an animal or group into ZIMS means that you are creating the very first record for it. Examples of Accessions include:

- A fetus identified or egg(s) laid
- A hatch or birth at your facility NOT from an identified fetus or recorded egg, regardless of ownership or survival
- A hatch or birth at a non-SPECIES360 member facility but you are the owner of the animal
- An animal collected or rescued from the wild (providing that it had not previously been accessioned and released to the wild by an SPECIES360 member institution)
- An animal that appears at your facility
- An animal received from a non-SPECIES360 member that has NEVER been at an SPECIES360 facility. It is best to search for the animal in the database before creating an accession in case it had been present at an SPECIES360 member facility at some time and therefore already accessioned into ZIMS.

ZIMS

ZIMS performs an automatic search within the database using the Source mnemonic and Local ID whenever you accession an animal or group. This search helps to guard against the creation of duplicate records for entities already in the database.

For transfers recorded AFTER the initial Accession, Visits are created. Examples of Visits include:

- An animal received from an Species360 member that is already in the ZIMS database
- An animal received from a non-Species360 member that had previously been held at an Species360 member facility
- Recapture of an animal previously released to the wild
- Retrieval of an animal that had been recorded as missing

Recording Events actually create a change in the entity. Examples of Events include:

- Birth of an accessioned fetus
  - Entity changes from Fetus to Individual
- Hatch of an accessioned egg (s)
  - Entity changes from Egg to Individual or Group of Eggs to Group of Animals

What You Should Record

Any individual or group held by or owned by your institution should be accessioned, or a visit created for

them. The reasons are:

- They reside on the institution grounds
- They may come into contact with members of your permanent collection
- They are under the care and management of the institution
- They are usually generating medical data
- You have legal ownership of it
- If the specimen is sent to another SPECIES360 institution there will be no gap in the records

There are some exceptions to the above:

- Feral and wild specimens that live on the institution grounds are usually not accessioned. However, if there are any medical procedures done on them, or they are held in an animal enclosure, you may want to record an accession for them to allow tracking of medical care and possible exposure of disease/parasites to your collection animals. If you do not want to do a Full Accession you can do an Incomplete Accession for such animals (see 06.e for Incomplete Accessions)
- Animals purchased for feedstock are not usually accessioned although ZIMS does have an option to track Feedstock Collections. These animals can be marked for local view only (see 17.c Collections).
- Live rock, although this can be recorded as a colony in ZIMS

Because ZIMS has the functionality to record pre-birth/pre-hatch events (i.e. fetuses and eggs) you will need to decide how, or if, you are going to use this functionality. There may be only specific species that you want to track at this level of detail.

Individual versus Group or Colony

Individuals can be identified as such – this means that you can tell them apart. They have unique identifiers that can be **physical** (example: tags, transponders, coloration or scars) or **logical** (example: House Names and studbook number). They can also be considered individual if they are held in separate enclosures. Each individual has it's own single global record and a single GAN.

There are three types of Individuals in ZIMS:

- Individual Animal
- Single Egg
- Fetus

A group is made up of members that either:

- You cannot tell apart and are in the same enclosure, or
- You have chosen to manage as a group even though you can tell them apart

Each group has its own single global record and a single GAN, the only difference is that there is more than one member included under the single GAN. The total count recorded for the group will appear on your reports and be calculated into your inventory.

There are three types of Groups in ZIMS:
- Group of Animals
- Group of Eggs (can be counted, usually a clutch)
- Egg Mass (difficult to count)

There is one other entity available in ZIMS – a Colony. A Colony can be:
- A very large group where you do not want the count reflected in reports (10,000 honeybees will make your collection very large)
- Corals and anemones

Although you usually do not record the estimated numbers in the colony, you can indicate how you wish this count to be reflected in your inventory (usually listed as "1 colony of bees" or "1 colony of coral") from Institution Preferences or from within the record itself.

When creating a Visit, it is very important that you create it for the entity as it was sent. If a Group was sent, accept as a Group and split out Individuals after if you want to manage as Individuals. If Individuals were sent, accept as such and merge them into a Group after if you want to manage them as a Group record.

When recording Group information, it is important to record what is known. It is advised to not add false data to make births, deaths and numbers add up. Make use of the census functionality to regularly record the count of animals and record as births/hatches or deaths in My Transaction stream only when that information is known. Because the Inventory Report does not capture census information, the numbers may not add up across in the report.

Be very careful when creating a Receiver Initiated transaction for the receipt of a Group. You may only be receiving some of the members of an established Group and if you record receiving the entire Group the transaction will have to be deleted and sorted out.

Transaction Dates

Animals should be accessioned, or a visit created, as soon as possible. The date used for the accession should be the date that you:
- obtained legal title, or ownership, or
- physically received the animal, or
- obtained both legal title and the physical animal

This is because on those dates you have accepted responsibility for the animal, legally and/or physically. Your records should reflect this responsibility. One area of disagreement is with animals collected from the wild. Many institutions use the date they returned to their facility as the Collection/Accession date. As mortality is often high in these situations, this approach reduces the record of deaths. However, this is not a Best Practice as you physically have the animals as of the collection date (they may not be on grounds but your staff is

responsible for their care and health) and you have probably also taken legal ownership unless it is a government owned species. For animals that were collected from the wild by someone other than your staff then that would be From Another Institution and the date you received them would be the correct Accession date.

ZIMS

ZIMS does have fields for recording both the Collected Date and the Accession Date for those institutions that firmly believe they should not be the same.

The date used for the Disposition should be the date that you:
- surrendered legal title, or ownership, or
- physically sent the animal off, or
- gave up both legal title and the physical animal

ZIMS

For Disposition of Missing you have the option to record two Disposition Dates – the date the animal was last seen and the date you decided to record the Disposition. Various circumstances will dictate if these are one and the same date.

For those transactions where you do not receive or give BOTH the physical animal and the legal ownership, you may have two Accession or two Disposition dates, one reflecting the physical location change and the other the ownership change.

Often dates need to be estimated. Many times these estimated dates involve historical data, but sometimes even your current data involves estimating dates such as a marsupial or denning animal birth date or chick hatch date. Incorrectly estimated dates can have major impact on population management. For example, incorrectly estimated birth dates can result in females remaining with their sire past the age of sexual maturity, resulting in unwanted and inbred offspring.

Almost every date in ZIMS can be recorded as an estimate. There are six ways to estimate dates and you should select the correct one for the situation at hand. You can always go back and update the date estimation should you receive more information. The hope is that you would further limit the dates included or, in the best case, you would be able to record a precise date.
- Range – use this when you know the date is between two known dates, the application will automatically calculate the date field
- Approximately Before – the date was sometime before the date in the date field. The date in the date field should usually be the date of the first reference to the animal. This estimate is often used for births and acquisitions.

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- Approximately After – the date was sometime after the date in the date field. The date in the date field should usually be the date of the last reference to the animal. This estimate is often used for deaths and dispositions.
- Variance – use this when you know the date could have been sometime before or after a date such as approximately three months ago
- Undetermined – you don't know the actual date now but you hope to be able to obtain this data later. Enter the date of the first (birth or acquisition) or last (death or disposition) reference to the animal in the date field.
- Indeterminate – you will never know the actual date. Enter the date of the first (birth or acquisition) or last (death or disposition) reference to the animal in the date field.

For an estimated date, the date that is entered into the date field is what will display in reports and what will be used for analysis. Some of the estimate options give the same result as far as the Date Field and length of estimate. For example, if you know an animal was born sometime in 1985 you have two options. You could use a Range option with a From Date of 1 January 1985 and a To Date of 31 December 1985. The application will automatically calculate the mid-point (1 July 1985) for the date field. You could also use a Variance option with the date field entered as 1 July 1985 and a Variance of 6 months.

Some important reminders for estimating dates are:
- Are all the dates included in the estimate possible? This is especially important for estimates by Variance where dates go both before AND after the date field.
- Did the possible dates overlap with other information such as a known death date?
- Use species biology to help estimate the date and select the appropriate estimate option.
- Document in Notes why the date was estimated and how the estimate was determined.

Terms

Terms of a transaction deal with who is receiving or giving up legal Ownership and who is receiving or dispositioning the actual Physical animal. There may be conflicts in what institution says what regarding Terms, especially in historical transactions. This is one reason why it is so important to have signed transaction documents, signed by all involved parties, stating exactly what is happening. Sometimes conflicts in Terms cannot be resolved and the Terms should remain as your institution best interprets the facts that you have.

Institutions

You can add locally used institutions into ZIMS. In addition to adding institutions that you have animal transactions with you may need to add some of the following into the Institution List as well:
- Listing Authorities
- Component Manufacturers
- Transponder Makers
- Shipping Companies

It is highly recommended you contact SPECIES360 prior to adding a local institution to limit duplication as it

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may already be in the global list and you just did not find it. These locally added institutions will not be displayed in the global institution list; your institution will only see them listed locally. They will display in reports and within the animal record, but will not be hyperlinks to their details as the global institutions are.

Local IDs and GANs

When an individual or group is first accessioned into the ZIMS application it is given a GAN (Global Accession Number) by the application. This is the most important identifier the animal or group will receive as it will always remain the main identifier for the animal/group, no matter how many institutions the specimen visits. Additionally, you must assign a Local ID, specific to your institution. This Local ID helps support the legacy software of SPARKS and MedARKS. SPARKS does now accepts GANs as an Identifier, but all of the reporting and studbook reconciliation is tied to the Local ID. In addition, SPECIES360 Users are habituated to using Local IDs as primary identifiers for their animals.

Some things to note regarding Local IDs:
- It must be unique, you are NOT allowed to duplicate Local IDs, regardless of taxonomy
- Local IDs can be coded – but WATCH OUT! Regardless of how clever you may be with your coding, as soon as one Local ID is not consistent with this coding, it makes others questionable. Coding also tends to shift with changes in staff members also, leading to inconsistent use of coding.

ZIMS

ZIMS allows you the ability to auto-increment your Local IDs as an option in Institution Preferences. This can save time as the next Local ID will automatically pre-fill. It may also prevent errors in skipping sequential Local IDs if multiple Users are entering acquisitions.

Collection Types

Most animals/groups accessioned into your institution records will be placed into your "Main Institution Animal Collection". The collection contains your exhibit and breeding animals. However, ZIMS provides other Collection Types to help you manage your animal collection should you chose to separate the reason you have an animal or group. These types include Education, Research, Rescue/Rehab, Feedstock and Confiscation to name a few. By default all animals/groups are viewed globally in accordance with ZIMS data-sharing abilities. However, you can mark a Research or Feedstock Collection as local view only and the data on the animals assigned to them will not be shared.

Recording Parents

Parents can be one of the following:
- In the ZIMS database
- Not in the ZIMS database
- Undetermined
- Indeterminate
- Wild

If the parents are in ZIMS you can search by Identifier (GAN or Local ID) and Institution, or by Institution and Taxonomy. It is recommended to actually view the record once it is found to assure that you have the correct animal. Once the parents are entered, the taxonomy field will default to the lowest common denominator of the parents.

If the parent is not in ZIMS then you must provide information about the institution, taxonomy and parent type as there will be no data on the animal in the ZIMS database.

If you select Undetermined, Indeterminate or Wild, the taxonomy of the animal you are accessioning will not pre-fill as there has been no taxonomy recorded yet. An animal with both Sire and Dam recorded as Wild will display as a Founder animal in the pedigree.

In most cases the Percentage Probability for each parent type will be 100%. However, there are times when there may be more than one known sire or dam. Do not create fiction by assuming that it is the most logical choice (example: the silverback gorilla must be the Sire of the offspring). If there are any other possible parents they should be recorded, and a percentage assigned to them. The total percentage for sire or dam probability cannot be more than 100%. The application can automatically calculate the percentage if it is evenly spread. If it is not you will need to do that manually.

If you have potential unsexed animals who may be possible parents, you can enter them into both the Sire and Dam fields. You can also choose to enter unsexed animals into the Undetermined/Indeterminate Parent field and not record as a Sire or Dam.

Recording Taxonomy

If you are recording the initial accession into ZIMS you will be required to enter the Taxonomic Name. If you have recorded the taxonomy of the parents (see above), the taxonomy field will pre-fill with the lowest common denominator of the parents but can be edited. Enter the taxonomy to the most known detail, usually to the species or sub-species level. Do not create fiction by assigning an unsubstantiated sub-species. In ZIMS you can enter an animal only to the Class level (example Aves and Reptilia) with the hope that you will be able to be more specific at a later date. How taxonomy was determined can be indicated by using the Taxonomy Determination field; although not mandatory, it is recommended that you provide details in this field.

If you have entered Parents of different species or sub-species, the application will automatically indicate that the animal in focus is a species/sub-species hybrid. If you do not know the parents, but know the animal is a hybrid, the appropriate checkbox should be checked manually.

The Taxonomic Name will be pre-filled if you are creating a Visit for an animal. As a subsequent holder you can choose to change this Taxonomic Name but you should only do so if you have firm reasoning as to why it should be changed. However, globally the taxonomy will remain and display as per the originator of the record until changed by them, and it will show as a conflict in the record. However, if you have selected

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"DNA/RNA/Genetic Analysis" as the Taxonomic Determination Method, the global view will be displayed as per your entry even if you are a subsequent holder.

You can create local synonyms for both taxonomic and common names. Remember, what will be viewed globally will still be the SPECIES360 taxonomy.

Recording Sex

Sex is, of course, an important part of an animal's record. In ZIMS the global view of sex displays the information that was recorded by the most current/last holder as the older the animal is the more likely the sex can be determined correctly. You cannot edit a sex entered by another institution, but you can enter the sex as you see it. If you choose to edit a sex record, you must provide a date when the sex was changed. If you want to know that the animal was managed as a different sex for a period of time, you should record a Sex Change Event on the date the sex was determined and leave the original sex record intact. If you do not wish to see that the animal was believed to be a different sex, then either edit and update the existing sex record to reflect the correct sex (if you recorded it) or add a new sex change event using the original recorded date (if you did not enter the previous record).

Pending Transactions

Pending Transactions involve transaction between SPECIES360 members. Any transactions that involve non-SPECIES360 members will not create Pending Transactions. There are two tabs in Pending Transactions:

- By My Institution – an action is required by your institution. Another SPECIES360 facility has either sent you an animal/group or they have recorded that they received an animal/group from you. This last scenario is a Receiver Initiated transaction and means receiving the animal was recorded before the sender recorded sending it. You have the ability to clear this list by reviewing each transaction and acting on it.
- By Other Institution – an action is required by another institution. You have either recorded sending an animal/group to them or performed a Receiver Initiated transaction and recorded you received an animal from them. You cannot clear this list yourself but instead must encourage and assist the other institution to do so by performing the appropriate action.

You cannot remove a transaction from this grid directly. You can select to Archive them should you wish to deal with them at a later date when more information may become available.

To perform an action on the Pendings in the By My Institution tab select the GAN hyperlink which will take you into the My Transactions tab for the record. The Pending transaction line is highlighted in yellow. You have five options for actions to take on the Pending:

- Confirm/Edit – use this option when you agree that the transaction took place. You will be able to edit most of the transaction fields to represent what you believe happened. Selecting Confirm will remove the Pending from both institutions. A confirmed transaction displays with a green circle in My Transactions.

- Deny – use this option when you do not agree that the transaction took place. Usually this occurs when an incorrect animal was recorded as being sent. Selecting Deny will remove the animal from your By My Institution Pendings and send it back to the other institution to act on. If another institution Denies a transaction it will display in red under By My Institution. You have two options. If you agree that you made an error you will select to Delete that transaction in your My Transactions grid and it will be removed from your Pendings. However if you still believe that what you recorded was correct a conflict in the record will remain. If this conflict results in an animal being in two places at one time you will need to contact support@Species360.org to have them create a new record. In all cases let the other institution know why you denied. A denied transaction displays with a red circle in My Transactions.
- No Information Available – use this option if you cannot either Confirm or Deny the transaction. It may have happened but you have nothing to prove that it did or did not. This is often used for cleaning up historical record Pendings. Both Pendings will be removed from the grids. This selection displays with a yellow circle in My Transactions.
- Not Recorded in ZIMS – this option means that you do agree the transaction took place but you have not yet, or do not ever, intend to record it in ZIMS. Both Pendings will be removed and My Transactions will display with a blue circle.
- Delete – this will remove the transaction from the record. If you have other Pendings in the same record you cannot remove just one and save successfully.

If you mark a Pending as Deny, No Information Available or Not Recorded in ZIMS it will disappear from your My Transactions grid. However, you can get it back should you wish to change your selection by checking the Include Unconfirmed Transactions checkbox that appears to the upper right of the grid.

If you have more than one Pending Transaction in a record you will need to address them all before you can successfully Save All Changes.

You should not let Pendings sit without taking the appropriate action whenever possible. Not acting on a Pending could create a break in an animal's transaction record or cause the animal to be in two places at the same time.

Incomplete Accessions
Incomplete Accessions allows a staff member, usually the Veterinarian, to start an animal record without creating a Full Accession. This allows for medical and husbandry information to be recorded before a full record is created. There are two types of Incomplete Accessions:
- Ones that have been created within the ZIMS application
- Ones that have migrated from the MedARKS application

In most cases Incomplete Accessions created directly within the ZIMS application are intended to be associated with full accessions in a timely manner. They can also be created when you simply want to gather some information, usually medical, on an animal but have no intention of later associating them with a full

accession. This is not generally considered to be a best practice because if you are gathering information the animal is probably physically on your grounds and should be accessioned fully. Exemptions could be wild animals that you are gathering data on.

To create an Incomplete Accession the only fields are Taxonomy, Sex, Birth Date and Notes. You can enter the same information on an Incomplete Accession that you can on a full accession EXCEPT for Entity selection (individual, group, egg, etc.), Parentage, Collection and Enclosure information. You also cannot disposition an Incomplete Accession. Any information recorded in an Incomplete Accession will migrate into the full accession record.

There are two types of migrated Incomplete Accessions:
- Those that came over from "non-accessioned" animals in MedARKS
  - Some of these may be records for animals that have been fully accessioned into your collection but were never associated
  - Some may be records sourced from another institution that were never meant to be associated with your institution
  - Some may be for animals that you recorded medical data on but never intended to fully accession
- Some are records that were unable to be "linked" to existing animals in the ZIMS migration from MedARKS

There are two ways that you can associate a full accession with an Incomplete Accession:
- Create a full accession using one of the accession flows. Upon Saving the application will look in the Incomplete Accession grid to see if there are any possible matches. If there are, select that record and select "Associate with Incomplete Accession" tab. If you perform a Batch Accession the application will NOT look in the Incomplete Accessions.
- Go to the Incomplete Accession grid, check the appropriate record and Complete Selected. The application will ask you which full accession that Incomplete Accession should be associated with.

There are three other actions you can take on Incomplete Accessions:
- Remove Selected – chose this ONLY if there are no medical of husbandry records associated with it OR it was sourced from another institution and the animal was never at your facility OR you don't care if you lose that information
- Archive Selected – this option will remove the Incomplete Accession from the grid and "hide" it. You should select this option when you have not yet decided if the Incomplete Accession should be associated with a full accession or Removed. To see any Archived record select to Include Archived Records.
- Active Selected – this will bring an Archived Incomplete Accession back to Active status and will display in the grid

It is recommended that you try to sort out the migrated Incomplete Accessions and take appropriate actions on them. If an association should have been made but it has not, the full accession record may be missing important data. You should also try to associate newly created Incomplete Accessions with full accessions in a timely manner, so all information is contained in one record.

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Life Status Changes

Births/Hatches

For births/hatches follow these guidelines:

- All births, premature births, stillbirths and abortions should be recorded as of the date they occur.
- Marsupial births should be the date the neonate enters the pouch, NOT the pouch exit date. This actual birth date will probably need to be estimated, usually from morphological measurements. A good source is Birth Date Determination in Australasian Marsupials edited by Carol Bach and available by contacting the Zoo and Aquarium Association at www.zooaquarium.org.au.
- For other species where the birth is not observed (example: denning bears) the actual birth date should be estimated and should not be the first seen date (see 12 Estimating Dates).
- Chicks that die in shell are equivalent to the mammalian premature birth. If you have not recorded the egg then the birth and death date will be the same. (see 08 Recording Prebirth/Prehatch for recording eggs).
- Amphibian birth date should be the day they hatched, NOT the day they metamorphosed. Using the Developmental Milestone (see 16 Life Stages and Development Milestones) functionality you can capture the metamorphosis date.

ZIMS

In ZIMS, the global view of a specimen's recorded Birth Date will reflect what was entered by the originator of the birth information. ZIMS assumes that this institution was closest to the birth event and therefore would know the most accurate details of the birth. The local view that is displayed to only your staff will show whatever you have entered as the birth date. The Basic Information screen will display in red when there is a conflict for that information.

To determine the birth/hatch date for events you cannot observe you may need to use the species biology to obtain an accurate estimate.

For stillbirths or abortions that you have not already recorded as a fetus you have two options:

- You can create a birth and a death on the same date
- You can record a fetus identified a day prior to the stillbirth or abortion. Use a date estimate of Approximately Before or other date estimator depending on how accurately you can estimate the conception date. Then record a death of the fetus.

For births where parentage is not determined until survivorship you have these options:

- Record your institution as the Owner at Birth. When ownership is determined
  - Donate (Ownership Only) on the date of ownership determination OR
  - Edit original Birth record Owner OR
  - Use the Designated to Parent Institution option
- Record the possible Owner from the Birth date. If it does not survive then edit the Owner back to your

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Fetus

Any identified fetuses should also be recorded. This pre-birth record can provide valuable information on reproductive activity and parental fertility. You can also gather developmental information on the fetus such as results of ultrasounds.

If the fetus is successfully born you will record an Event and not a Transaction. The entity of Fetus will change to Individual.

ZIMS

If the dam is dispositioned while she is carrying the fetus you will receive a warning that you should record the same transaction on the fetus record. If the dam dies it is not assumed the fetus also died and you will receive a message to record the appropriate outcome of the situation in the fetus record.

Egg(s)

Recording eggs when they are laid often provides valuable information regarding the parents as parental care can be recorded on them. You may choose to accession only known fertile eggs but at minimum all late term fertile eggs should be recorded, regardless of outcome. If you can identify the eggs individually you should accession as single eggs. If they are not individually identifiable, or you chose to manage them as a clutch, you can record a Group of Eggs.

As for a birth of a fetus, for the hatch of an egg you will record an Event and not a Transaction. If a Single Egg hatches the entity will become an Individual. If a Group of Eggs hatches the entity will become a Group of Animals. For a Single Egg or a Group of Eggs where the entire clutch hatches on the same day this is simple. For a Group of eggs that either do not all hatch on the same day or if the entire clutch does not hatch you have two approaches:

- Wait for the entire clutch to hatch. If some do not hatch first record any Death or Disposition information. Then record a Hatch Event for a Group of Eggs. If all the eggs hatched on the same day, if you chose to split the hatchlings out as Individuals they will have a specified hatch date. If all eggs did not hatch on the same day select the All Eggs Did Not Hatch on the Same Day checkbox and record the appropriate Range of hatch dates. If you chose to split the hatchlings out as Individuals they will all have an estimated Hatch Date.
- As the eggs hatch, split them out into Single Eggs and then record a Hatch Event. Once all the eggs have hatched you can record any information on remaining infertile or Dead in Shell occurrences. With this approach each Individual will have specified Hatch Date.

You do not have to use the same approach for all Group of Egg hatches at your institution.

One of the optional fields in the Fetus accession screen is Expected Birth or Hatch Date. If this can be estimated you can place an Alert in the parent record to watch for signs of birthing.

Deaths or Dispositions

If the fetus is stillborn or aborted, you will record a Death transaction. The entity of Fetus will remain as Fetus.

If the fetus is born but dies soon after you should record a Birth Event and then a Death.

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Recording Identifiers

An animal record has two Identifiers by default

- The GAN, which will never change, is assigned by the ZIMS application and cannot be changed or edited by a User.
- The Local ID which is assigned by each institution who holds or owns the animal/group. A Local ID is not a mandatory field when recording Eggs or Fetuses but is required should they hatch or be born.

The only time an Identifier should be removed from the Identifier grid in ZIMS is if it was entered incorrectly. You cannot remove identifiers entered by another institution although physical identifiers entered by others can be edited.

ZIMS

Because animals may have many identifiers that are no longer active, ZIMS has the ability to track the changing status from active to inactive, in-use or removed. In addition, to help shorten your reports you can select that only active identifiers are displayed.

Local IDs

Once a Local ID is assigned it cannot be changed or edited at the institution level. If required, you can contact SPECIES360 to change a Local ID. It is generally not recommended to code your Local IDs although many institutions like to. The reason for not recommending coding is that at some point it will probably fall apart, making any coded Local ID questionable. For example, you could code your Local IDs by first two digits the year of accession or visit, and the last four the order in which they arrived. For example, Local ID 150035 would mean the animal arrived in 2015 and it was the 35th animal recorded. However, you have a kangaroo joey discovered that was actually born well before this 35th animal arrived so its Local ID should be before 150025 but would be 150036. It is NOT chronologically the 36th addition to your collection effectively making all the Local IDs created in that year questionable.

ZIMS

To save you data entry time ZIMS allows the Institutional Preference to Enable Auto-incrementing Local IDs. The next available Local ID will prefill into your accession screen.

Physical Identifiers

Physical Identifiers are tangible and can be seen. Physical Identifiers can be artificial such as tags and bands, or natural such as scars or coloration. Although transponders are physical identifiers, they are given their own major listing (see below). For a Physical Identifier you can provide the On-animal Location (example – foot) as well as one or more descriptors (example – hind, left). If a physical identifier is removed from the animal or lost you should update the status to reflect this and leave it in the grid. You can edit the status of Physical Identifiers not entered by your institution.

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Logical Identifiers

Logical Identifiers are those that cannot be seen such as Local ID, House Name and Studbook Number. Because they cannot actually be seen they can sometimes lead to mis-identification in records. Checking a Physical identifier in addition to the Logical one can guard against such errors.

If a logical identifier becomes obsolete you should mark it as Inactive if you entered it. You cannot mark a logical identifier that was entered by another institution as Inactive.

Transponders

Transponders are a type of physical identifier managed more closely than the other physical identifiers in ZIMS. They are tracked using an inventory found in the My Institution module and some countries require that they are also registered. You can assign a transponder to an animal prior to inserting (implementing) it into the animal. This can be helpful for permits where you may need to record what transponder the animal will have but don't want to risk anesthesia simply to insert it. Assigning a transponder is not a required first step and transponders can be inserted (implemented) without being previously assigned. Some regions do not consider assigning a transponder to be a best practice and feel the transponder should be in the animal prior to applying for official paperwork to avoid any mistaken identities.

You can edit the status of transponders entered both by your institution or another institution.

ZIMS

ZIMS also has the ability to attach images to the animal record. This is especially helpful to identify spotting or striping patterns or specific physical characteristics of an animal.

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Recording Sex Edits/Changes and Contraception

There may be times when you need to change a sex of an animal in your collection. Sometimes it has been incorrectly sexed at your facility or elsewhere, sometimes the sex was not known and in rare circumstances the sex has actually changed. You cannot edit a sex recorded by another facility, but you can edit one recorded by you. In the Global record the sex type will display as what has been recorded by the last/current holding institution. At your facility the sex will display as per what was recorded by you.

Usually if the sex was incorrectly recorded by your facility, or an unknown sex type has been determined, the record should simply be edited, with notes in the Details box as to why it was edited. However, there may be times when you wish to keep the previous sex information to understand why an animal was managed as it was. In these situations, you would record a sex change as of the date the sex type was determined.

When recording contraception remember that entering an End Date will not automatically mark a previous contraception as Inactive. This is because an animal may have more than one type of active contraception at a time. You will need to change the Status manually should a contraception become inactive. Always use the Details box to describe exactly what the contraception is as the Method selections are either Animal Management or Medical and do not specify what is being used. Contraception by Management can include methods such as keeping animals separated or adjusting light cycles.

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Life Stages and Development Milestones

Life Stages are the stages of development that animals go through from conception to death. Some examples are infant, juvenile, adult and geriatric. Life Stages have a beginning and an end date. The end date is usually the beginning date for another Life Stage. Life stages are taxonomically driven; invertebrates will not have the same stages as mammals. Tracking Life stages can often help you see if an animal is developing at the normal pace when compared with the development of other members of its species. It is important to know that ZIMS will not automatically change a Life Stage so if you forget to update it the information will be erroneous. An example would be if you received a gorilla as a juvenile and recorded that Life Stage but forgot to update it. At 10 years old the gorilla would remain a juvenile. Do not use Life Stages unless you intend to keep them updated as the animal matures.

A Development Milestone is an action or event that marks a significant change in development. Development Milestones have only one date, the date that milestone was achieved. Like Life stages, Development Milestones are taxonomically driven as not all species have the same milestones. Unlike Life stages however, it is not as important to keep them updated as an animal does not move from one milestone into another and the date of the milestone will remain through the life of the animal. There may be some specific milestones, such as Weaning or First Birth, that you wish to capture but do not care about others such as Teeth Eruption.

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Guidelines for Recording Notes and Observations

Notes and Observations are free text fields that can be used to:

- Capture details not captured in other fields in the application.
- Add explanations as to why data was entered the way it was.
- Add explanation as to how data entered in other fields was determined. Example: the birth date was calculated from out of pouch data using "Birth Date Determination in Australasian Marsupials (ZAA).

How you enter free text needs to be clear not only to you but to anyone else reading the record, today and in the future. You may understand what you are saying but it may be unclear to others.

Some suggestions are:

- Do not use slang. Common slang in one region may not be in another, certainly not in another country; besides that, slang changes over time.
- Be very careful with abbreviations. Some are internationally recognized, but it is best to avoid them if possible.
    - o HINT: If you do use abbreviations, the first time you record them ensure that the full text of the abbreviation is included. Others can then reference that data within the record.
- Do not use texting acronyms. "BTW" (by the way) and "LOL" (laugh out loud) are not appropriate in an animal record or document.
- Develop a list of Keywords to make searching for data easier.
- If you are referencing other animals in the Note or Observation include the GAN or Local ID. Simply stating "exhibit mate" will not be clear in the future. An easy way to include this information is to use the Batch Note functionality and check the box to include the Local IDs in the entry.
- Be concise.

ZIMS

When you are recording a Note or an Observation you have the ability to check a box to include in the text the Local IDs of all animals the information was recorded against. In the Note box remember to add the Note text BEFORE this list of IDs.

ZIMS differentiates between Notes and Observations. Both have the option to include Keywords, and the Types and Sub-Types are identical. Observations allow you to record more information regarding the entry such as Observer, Observation Quality and Time/Duration. How you chose to use Notes and Observations is up to your institution. A simple example of what might be a Note and what might be an Observation involves a birth:

- The keeper opens the zebra barn at morning check and there is a new foal in the stall. That would be a NOTE.
- A keeper is posted overnight in the zebra barn. He observes the contractions, birth and maternal care of the offspring. That would be an OBSERVATION.

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If there is specific information that you always want to have recorded on a particular Note or Observation, you can create a Note Template for it and pull up this template anytime you enter that type of text entry. In addition to saving time, templates help you remember all the data you want to include in the entry. In addition, templates can assure that entries by multiple people are recorded in a standard way for these free text fields.

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Enclosure Information

Developing the Tree

It is important to set your enclosure tree up in the best way to allow you to retrieve the data (the Parent-Child relationship). Think about how you will want to retrieve information while you are either developing your tree or re-arranging a non-functional tree. The option to "include sub-enclosures" on some reports and searches will allow you to retrieve information regarding not just the Parent enclosure but the sub-enclosures (child enclosures) that exist underneath it. In the tree below "Primate Row" is a Parent enclosure to "PR1", "PR2", "PR3", and "PR4".
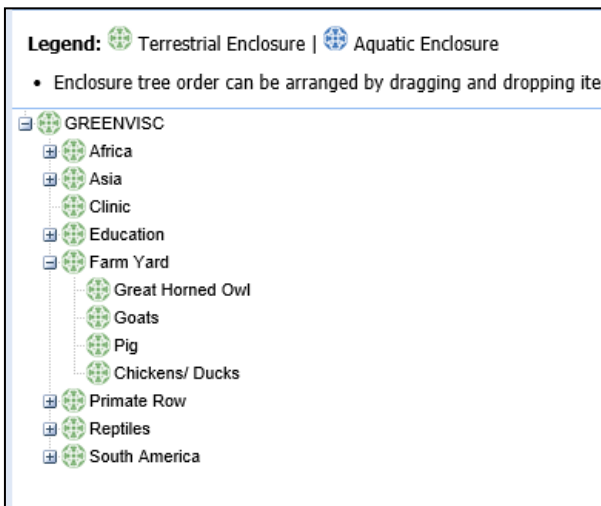
![ZIMS]

To quickly rearrange a tree that has not been properly organized you can "drag and drop" an enclosure from one Parent into another to easily fix the order.

Also think about how to name your enclosures. Although easiest, it is NOT recommended to use species names as the enclosure name since occupants often change. Develop a system that you can be happy with for years to come, regardless of which species are occupying the enclosure.

![ZIMS]

ZIMS has the ability to record a large amount of information on your enclosures. This includes the dimensions, barrier materials, substrates and even your planned taxa for the enclosure. In addition you can record environmental and water quality measurements to help you better manage the health and husbandry of your animal collection.

Allow Multiple Enclosure Assignment

The default in ZIMS is to allow an animal to be in only one enclosure at a time. However, as an Institution Preference you can select to Allow Multiple Enclosure Assignment. This means that an animal can be recorded

![SPECIES 360 Global information serving conservation.]

as occupying more than one enclosure at the same time. If this is your preference you will need to remember to manually record a Move Out date should the animal no longer occupy an enclosure. With single enclosure assignment, when you record a new Move In date the application will automatically record a Move Out date for the previous enclosure.

Although you can easily change this preference and go back and forth between single enclosure and multiple enclosure assignment, it is recommended that you decide which you want and stick with it to avoid confusing enclosure records.

Internal Animal Moves

You have two options when recording an animal move to a different enclosure:
- Record Current Enclosure – this enclosure move will record a move from the last enclosure an animal occupied into a new one. Only a Move In Date is required. If you have single enclosure assignment the application will automatically add a Move Out date to the last enclosure. If you allow multiple enclosure assignments you will need to manually indicate if the animal no longer occupies one or more of them.
- Record Historical Enclosure – this is used to record enclosure moves prior to the last enclosure. Both a Move In and a Move Out date are required. If you have single enclosure assignment this move record cannot overlap occupancy of another enclosure during the same dates.

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Institution Information

Local Administration

At least one person at your facility should be designated as a Local Administrator and given the Local Administrator (SPECIES360) Role. This person will have access to all of the Animal Husbandry and Inventory functionality in ZIMS. Often this is the institution's Registrar, but it can be any staff member who is charged with maintaining and overseeing the application.

Staff

Staff members must be entered into the Staff grid to be given access to ZIMS. However, you do not have to give ZIMS access to all your Staff. Sometimes they will be recorded in this grid so that their names will appear in the dropdown lists for Responsible Party and Observer. If you want a Staff member to be visible to others outside your facility you will need to check the Make User Visible Outside My Institution checkbox in the Add New Staff screen. If this is checked others will be able to view them when looking at your institution information and find them using the Contact Directory. If you complete the Communications Details for those staff visible outside your institution others will be able to easily contact them.

Roles

Assigning Roles to your staff is how ZIMS access is given. ZIMS has six SPECIES360 Template Roles that can be assigned. These Roles cannot be edited by you. When new ZIMS functionality deploys, SPECIES360 will update these Roles as they deem most appropriate.

You can also create custom Roles at your facility either based off of an SPECIES360 template Role and edited or starting with a blank Role where all access is selected manually. When new functionality is deployed you will need to manually assign it to each Role as you find appropriate, SPECIES360 will not update your custom Roles.

Collections

The various Collections in ZIMS are where you indicate the reason you have an animal. Collections allow for running reports at different levels. Because global sharing of data is encouraged, all Collections are globally shared except for Research and Feedstock where you have the option to indicate that Collection is viewable only by your institution by selecting a Local scope.

Teams and Departments

Creating Teams and Departments may be an easy way to help you manage your Staff. In addition, both Teams and Departments can be recorded as Responsible Parties and Alerts can be assigned to them. If your institution has decided to use the Advanced Access Management (AAM) feature in ZIMS you will need to create Departments as that is how the AAM access is assigned.

Permits and Licenses

When recording a permit, you are required to name it. These names must be unique within your facility. It is recommended that you develop a convention for these names for consistency. Some suggestions are:

- Listing Authority and date the permit was submitted (CITES 1 Jan 2013)
- Permit Type and date the permit was submitted (POSSESSION 4 May 2012)
- Action of the permit and the species (IMPORT gorilla)

When you submit your permit, you will probably not have the Permit ID. This can be filled in at a later date once the Listing Authority assigns a number or ID. Permits can be assigned to staff, enclosures and animals. By default, they are assigned to your institution. If other institutions are operating under the same permit you can also assign to additional institutions.

If you want other institutions to view your permits you should mark them as a Global scope. Marking your permits Global assists other institutions in transactions with your facility for transactions where permits are required.

Local Institutions

You can add locally used institutions for facilities and people you have transaction with that are not in the global SPECIES360 list. It is recommended to check with SPECIES360 first to confirm that it is not already on the Global institution list and you just cannot find it. Commonly added local institutions are laboratories (used in the medical module) and local breeders.

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Species360 Post Office

The Species360 Post Office provides valuable information regarding animals in your collection as well as other important notices. Some of the messages you may receive in your Post Office are:

- The other institutions records "No Information Available" or "Not Recorded in ZIMS" for a Pending Transaction involving your institution.
- An animal Out on Loan/Lease dies, goes Missing or is Released to the Wild
- An animal you have recorded as a Parent is deleted from the database
- Part of a record for an animal is deleted by another institution
- A medical term you added locally is made a global term
- Another institution has changed the sex of an animal is/has been in your collection. **This can be very important information especially if you have the animal recorded as an unsexed parent.** Remember never to change your records just because someone else says something, always confirm why the sex was changed.

Because this type of important information is available only in the Post Office, it is important that you read, and act on, your Post Office messages.

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External Record Sharing

In the early stages of zoos and aquariums when they were animal menageries and the goal was to have the biggest or rarest specimen, sharing of the animal records meant little and was seldom done. With the development of managed programs, first started at the regional level and now extending globally, sharing of your animal data has become highly valuable for:

- Tracking parentage for accurate breeding recommendations
- Improving husbandry practices
- Improving veterinary care

Ultimately, in a perfect world all data would be shared because all facilities have the same goal: to provide better husbandry and medical care for our animals, and to breed them in such a way that survival of the species is guaranteed. However, each institution has to decide at what level they will share their data. Government run facilities, such as city owned institutions, may have restrictions on what data can be shared with others. Researchers and Veterinarians may have concerns about misinterpretation of the information recorded by them if read by someone not knowledgeable in the terminology and standard procedures. You should always be aware of what data in your animal records is being shared and with whom. The decision of what data to share might not be made at the level of the animal records-keeper, this approval might have to come from above at the Curatorial, Director or CEO level.

ZIMS

By default, limited parts of an animal record are shared globally with other Species360 member institutions. The External Sharing functionality allows you to share almost the entire record with another facility. This is particularly helpful when you are sending an animal to another institution or to keep track of animals that are Out On Loan to another facility. Yearly loan updates on your animals are still recommended. If you do not want to share any part of an animal's record with other institutions, ZIMS also has the functionality to mark an entire Collection as Local view only. Any animal records recorded in that Collection would be viewable by your institution only.

To share a record with another institution, make sure that Accessibility for External sharing is turned on in Institution Preferences > ZIMS Accessibility and Features. You can share from within My Institution or the animal record itself.

ZIMS

ZIMS has several tools that use the default globally shared data in the ZIMS application to better help you manage your animals. Go to the Global Resources available under the Start menu to view these.

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References

[i] Zoos South Australia Animal Management Policy and Procedures – Animal Records Procedures, January 2011

[ii] Guidelines for Creating and Sharing Animal Records, Animal Records Task Force, AZA Institutional Data Management Advisory Group, 2077

[iii] Standards for Data Entry and Maintenance of North American Zoo and Aquarium Animal Records Databases; Lincoln Park Zoo; 1998

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