

Resource Manual for International Studbook Keepers



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Preamble

International studbooks (ISBs) approved by the World Association of Zoos and Aquariums (WAZA) through its Committee for Population Management have the following purposes:

- Providing a valuable service to the zoological community by offering the most complete and accurate global data on the *ex situ* population's pedigree and demography, if possible including husbandry and veterinary guidance;
- Enhancing management of the *ex situ* population through analysis of the ISB dataset.

The role of an ISB keeper is to assist in meeting these goals, which entails communicating and collaborating with multiple stakeholders at various levels (see Appendix 1, page 8), compiling and validating studbook data, and creating, distributing and reporting on the ISB. There are two main tenets to keeping an ISB. The *first* is to understand the philosophy and process behind keeping an effective studbook. The *second* is to understand the mechanics behind using studbook software (see Appendix 2, page 9).

Application for a New Studbook

After consultation with the relevant regional association(s), interested individuals should follow the procedure outlined in the application form included in Appendix 3 (page 10). Applicants are expected either to have expertise or training in studbook keeping, or to acquire such expertise through training courses, mentoring by an experienced individual or other mechanism within one year of ISB approval (see Appendix 2, page 9).

Initial Studbook Data Gathering

Once an ISB has been approved, the ISB keeper should:

- Contact Species360 and WAZA for an initial dataset of the taxon and for the most current version of the SPARKS program (Currently most of the ISB data are to be kept in SPARKS format¹, however some ISBs are managed using ZIMS for Studbooks);
- Contact the regional studbook keepers and seek additional data sources; for example, from the WAZA International Studbooks and GSMPs Advisor (see Appendix 4, page 11);
- Contact at least those institutions that are members of WAZA and/or regional associations that currently hold, or used to hold, the taxon. If an updated list of the members of WAZA is required, please contact the WAZA Executive Office at membership@waza.org. Each institution contacted should be informed that the ISB is in preparation and data on current and past holdings should be provided to the ISB keeper (regional associations can help facilitate communication to the appropriate individuals). Species360 member institutions should be asked to provide historical taxon reports as well as any additional data that may be relevant to the ISB.

¹ISB keepers employed at an institution that is a member of the Association of Zoos and Aquariums (AZA) may use SPARKS or PopLink for data entry. AZA-based ISB keepers should contact the AZA Population Management Center (pmc@lpzoo.org) if they are interested in using PopLink to ensure that ISB conventions are followed.

Studbook Data Compilation

An ISB should aim to include as a minimum¹:

- All specimens ever held in institutions affiliated with WAZA and/or regional associations (or within a population managed as part of a regional/global programme, unless exempted by the WAZA Committee for Population Management);
- Known holdings outside the WAZA membership, if feasible;
- All direct ancestors of these specimens (regardless of location), tracing lineage to original wild-caught founders;
- All stillbirths, premature births and early deaths should be registered as individuals to enable analysis into the effects of inbreeding, husbandry problems and hybridisation as well as investigations of medical/behavioural problems of (potentially important) individuals to be carried out.

It is noted that keepers of some ISBs, particularly those for taxa with long *ex situ* histories, may not be able to obtain records for all appropriate specimens; this should, however, remain the clear eventual aim of all ISBs.

The information maintained for each individual should include as a minimum:

- Identities of sire and dam (using the ISB numbers; see below);
- Sex;
- Date and location of birth;
- Full transaction history (all physical holding locations and dates of arrival);
- Name of current owner; where the holding institution is not the owner of the specimen, the ISB keeper should record all historical ownership changes as well;
- Where animals have been obtained from or released into the wild, the ISB keeper should record, if possible, details of the capture or release date and location;
- Any specimen identifiers (e.g. house names, local identification numbers, tags, transponders, tattoos);
- Any data on the reproductive potential of living animals (e.g. temporary contraception and dates, permanent contraception such as castration);
- Date and location of death;
- Cause(s) of death (contact Species360 for issues with entering death codes in SPARKS) and information on disposal of body. ISB keepers are encouraged to collect data on causes of death to enable studies of the effects of inbreeding and hybridisation and to identify potential husbandry problems. Institutions should provide formal necropsy reports to the ISB keeper as requested;
- Other information pertinent to a particular ISB (e.g. subspecies, genetic analysis);
- Where inevitable assumptions have been made, such as date of birth or capture, these should be clearly documented.

Additional detailed notes on any of the above should be made, as needed. ISBs for egg-laying species should include, if possible, data on clutch size, fertility and hatchability. All information should be included within the ISB dataset itself (using Species Notes or Special Data in individual records), not as separate paper records.

Each individual should be entered as a separate record and should be assigned a permanent number, unique to that ISB. Temporary numbers should not be used. A numeric numbering system should be used, normally starting with 1. ISB numbers need not be in birth date sequence. Gaps in numbering sequence are not important. ISB numbers should be shared with regional studbook keepers promptly, so that regional studbook numbers can, if possible, follow the ISB numbers (if different, they should not include letters). Once assigned, an ISB number *should not be changed* unless it subsequently becomes apparent that two numbers have been separately assigned to the same specimen. In this case, all information is consolidated under the first number (the second number should be retired and not reused), making sure that all offspring of this individual have the same parent identities entered. All institutions that ever held the specimen should be formally informed of the change in ISB numbers so that they can correct their records accordingly.

The standard Species360 institution list of mnemonics should be used for the locations at which animals are born, held or die. If additional mnemonics are needed, the ISB keeper should contact Species360 to have them assigned, as needed. ISB keepers are encouraged not to use PRIVATE, PUBLIC or UNKNOWN, as every effort should be made to solicit as specific and accurate information as possible.

Any data-entry conventions necessary to interpret the data should be documented in Species Notes. These will vary according to species. For example, “animals imported from the wild were assumed to be x years old on arrival, if no other information was available” or “all hatch dates otherwise unknown were estimated to the centre of the breeding season”.

Removal dates should not be entered for any events; instead, it is sufficient to simply enter the next event in the life of the animal (e.g. transfer, death, release). If an animal is transferred to an institution for which no contact can be established, and no further information is available, the animal should be indicated as “lost to follow-up” for that transfer. At no time should an artificial death date be created to end the record of an animal.

All known data should be included. ISBs should not “stop” as at the end of a calendar year or another arbitrary date. While an ISB may be published as at a date, such as 31 December 2012, any births, deaths or other events known to have occurred after this date should be included as well.

Studbook Data Validation

It is the responsibility of the ISB keeper not only to collect and enter data into a correct studbook format, but also to assess the quality of the data by investigating missing information, inconsistencies among reporting institutions, logical errors and other potential sources of error in the data (in SPARKS format, properly formatted and with data entered into the appropriate fields). Several tools exist to assist ISB keepers in data validation, including data validation tools within studbook software and Species360 data quality tools. Data validation should be performed, and potential errors investigated, before publication of the ISB.

Creating a Studbook Document

There are a number of basic requirements for content of an ISB. A published ISB should be able to be used as a primary source of information, without reference to previous editions. As a minimum, an ISB should include the following sections marked with *:

- ***A cover page.** This should include:
 - The species' scientific and common name;
 - The ISB keeper's name and institution;
 - The WAZA logo;
 - A picture of the species;
 - The "*currentness*" date;
 - Note that on the cover of the ISB, the year of the ISB must be included. The year should reflect the data that are contained in the ISB and not the year when the ISB was published. The data must be current at least to July 1st to be considered the edition of that respective year.

- ***An introduction.** This should include:
 - Detailed contact information for the ISB keeper, including telephone, fax (if available), e-mail and mailing address;
 - Information about any regional studbook keepers;
 - A statement about the key usage and which regions benefit from the ISB;
 - Current status of the *ex situ* population, for example:

The data reported in this studbook are current through 15 March 2012. As at that date, the historical population was 958.949.54 (1961) animals and the living population was 102.154.9 (265) animals in 39 institutions. This number includes:
29.30.3 (62) animals in 8 institutions in the Asian region;
6.14 (20) animals in 4 institutions in the Australasian region;
30.55 (85) animals in 18 institutions in the European region;
37.55.6 (98) animals in 9 institutions in the North American region.
 - Current status of the population in the wild;
 - IUCN Red List of Threatened Species status;
 - Taxonomic status, as needed;
 - Any relevant acknowledgements;
 - Announcements, etc.;
 - Data-entry conventions, as needed;
- ***A listing**, by Species360 mnemonic, of those institutions that have contributed data to the current publication and a similar listing of those that did not. This will serve to document potentially unreliable data;
- An overview of the species, including taxonomic description, distribution map and summary of the *ex situ* history;
- A short description of the natural history of the species;
- Photographs, as appropriate;
- A bibliography on behaviour, veterinary, husbandry, etc.;
- ***The historical animal data.** The full ISB report, in ISB number order, starting with the lowest number;
- Births, transfers and deaths since the last publication, in birth, transfer and death date order, respectively;

- ***The living population.** Living animals, sorted by their current location. A geographic sort order (grouped by institution within country) is preferable to an alphabetic sort order (by institutional mnemonic). Include at least one identifier, such as house name, transponder, tag, etc.;
- ***A glossary of all institutions/locations** included in the ISB. This should include details of the geographic location of capture/release sites listed, details of institutional addresses, and names and contact information for the relevant curators or registrars/records officers;
- A census graph and/or age pyramid graph;
- A population analysis of the *ex situ* population should be published periodically. The frequency at which the population analysis documents are produced is determined as is most appropriate for the taxon but should occur within, at least, a three-year cycle. The analysis should include a detailed genetic and demographic analysis of the *ex situ* population as derived from pedigree analysis. If necessary, this analysis should be performed in consultation with someone of acknowledged expertise in population biology. The inclusion of information about the *ex situ* population from other sources of research is encouraged;
- ***This notice:**
Copyright [year of publication] by the [ISB keeper's institution]. All rights reserved. No part of this publication may be reproduced in hard copy or other formats without advance written permission from the [ISB keeper's institution]. Members of the World Association of Zoos and Aquariums (WAZA) may copy this information for their own use. WAZA and the [ISB keeper's institution] recommend that users of this information consult with the ISB keeper for any interpretation and for the most current data.

Studbook Distribution and Reporting

The preliminary ISB dataset (in SPARKS format²) should be sent to Species360 for technical review within one year of ISB approval. Following review and remedial action, if needed, the preliminary ISB dataset should be expanded to a full ISB and published within one year of the Species360 review.

The ISB document should be distributed preferably in PDF format via e-mail. Recipients should include all participating holders and regional associations; regional studbook keepers and coordinators; the WAZA ISB Coordinator; Species360; the International Zoo Yearbook Office at the Zoological Society of London; the IUCN/SSC Conservation Planning Specialist Group; and the relevant IUCN/SSC taxonomic specialist group chair. The distribution addresses are included in Appendix 4, page 11.

Thereafter, an updated ISB dataset (in SPARKS format²) should be produced annually and submitted to Species360 and the WAZA International Studbooks & GSMPs Advisor, and the resulting ISB document should be distributed as above. If the ISB keeper has not submitted the ISB dataset and document within two months of the annual due date (i.e. one year after submission of the previous report, without having requested an extension), the ISB keeper (together with the relevant regional association(s) and the director or governing official of the supporting institution) will receive a notice from the WAZA ISB Coordinator that a report is

²AZA-based ISB keepers using PopLink for data entry should contact the AZA Population Management Center (pmc@lpzoo.org) prior to converting their data to SPARKS for validation and submission.

due within two months. If a report has not been submitted by that time (and the ISB keeper has not requested an extension), the ISB will be considered as vacant and a new keeper will be identified.²

The ISB keeper should report annually on the current status of the ISB via the questionnaire sent out by the International Zoo Yearbook Office at the Zoological Society of London.

The ISB keeper should register for the member area of the WAZA website to gain access to the information provided there with regard to ISBs.

Changes of Studbook Keeper and/or Institution

If an ISB keeper wishes to take the ISB to another institution, a written expression of support should be obtained from the recipient institution (“Statement of Commitment”) together with a written agreement of the ISB keeper’s former institution (“Statement of Transfer”). The application forms are included in Appendix 5 and Appendix 6, pages 12 and 13. These documents should be forwarded to the WAZA ISB Coordinator for approval by the WAZA Committee for Population Management.

If an ISB keeper is unable to continue maintaining an ISB, the WAZA ISB Coordinator and the relevant regional association(s) should be informed as soon as possible. Existing datasets should be passed on to Species360 and the WAZA International Studbooks & GSMPs Advisor for safekeeping and documents should be safeguarded by the supporting institution until a new ISB keeper is appointed.

The ISB keeper’s institution has the right to suggest the transfer of the vacant ISB to another person at the same institution. The application form (“Statement of Commitment”) is included in Appendix 5 (page 12). A CV of the applicant is required, including any expertise or training in studbook keeping, or indication of how the applicant plans to acquire the necessary competence through formal training and/or local mentoring (see Appendix 2, page 9). These documents should be forwarded to the WAZA ISB Coordinator as soon as possible for approval by the WAZA Committee for Population Management.

If an ISB becomes vacant and the supporting institution does not wish to retain it, the WAZA ISB Coordinator and the regional associations will identify suitable candidates. Applicants should follow the procedure outlined in the previous paragraph. The WAZA ISB Coordinator, in conjunction with Species360, will provide “*currentness*” of the ISB at the time of application and “*currentness*” of any other studbooks (international or regional) kept at the proposed supporting institution. That institution’s commitment to assist the candidate by providing adequate time, resources and financial support is a significant criterion when selecting a new ISB keeper. When an ISB is assigned to a new keeper, existing datasets and records should be passed on to the new ISB keeper promptly.

Co-keepers

On rare occasions, there might be two keepers for the same international studbook. In that case, one of the keepers needs to be the main keeper and the second one will be considered the co-keeper. The co-keeper also needs to be approved by WAZA’s Committee for Population Management.

Discontinuing a Studbook

There is a need to clearly articulate the reasons why an ISB might be discontinued (i.e. “archived”); for example, because there is no further need for the ISB, no captive animals are left to track or the ISB keeper could not be replaced, in a manner that demonstrates that all relevant stakeholders have been consulted. The WAZA ISB Coordinator will make a formal request to the WAZA Committee for Population Management, providing a rationale as to why the ISB should be discontinued and evidence that the supporting institution and regional associations have been engaged.

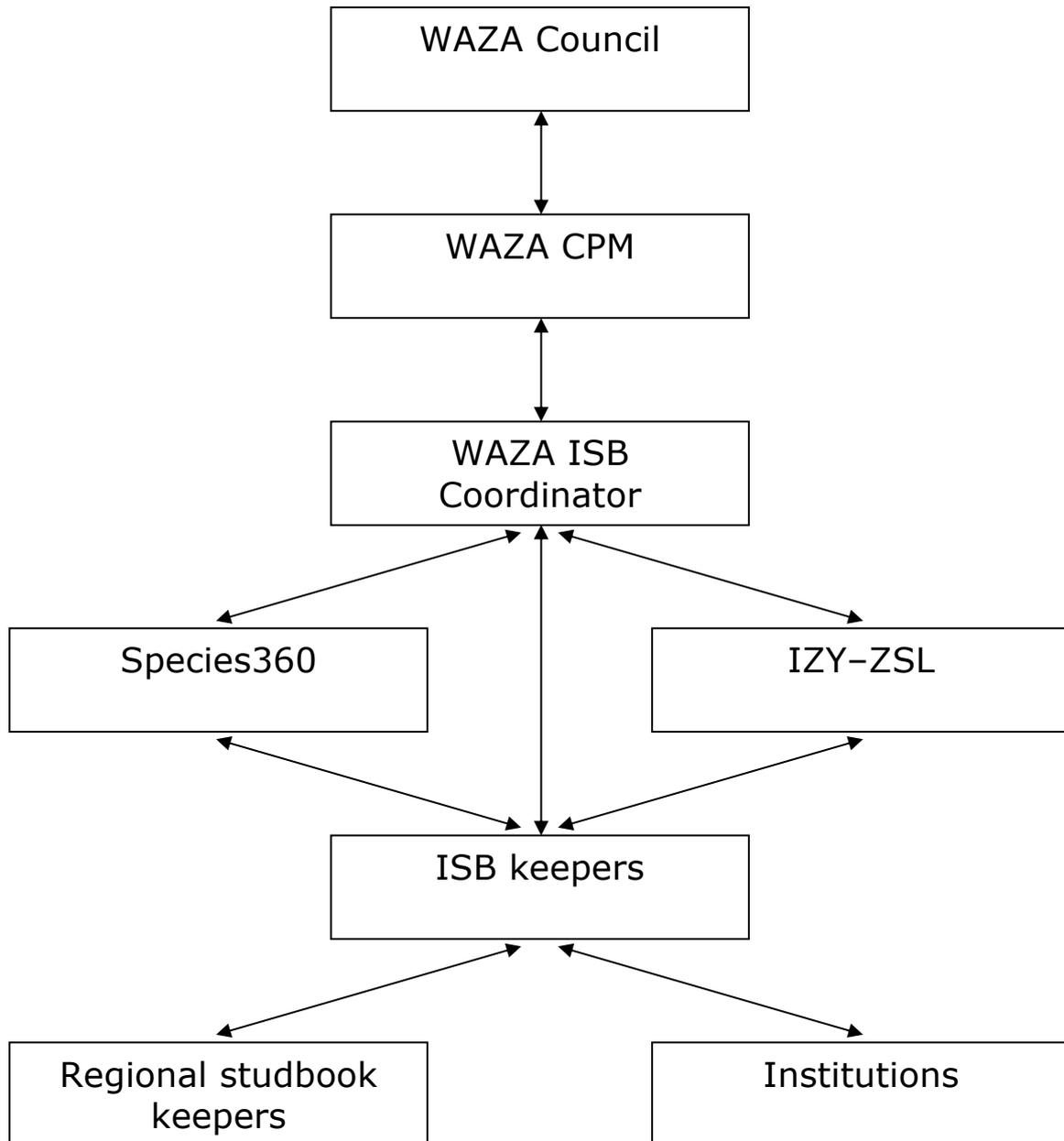
Studbook Complaint and Dispute Resolution

A regional association can formally register a complaint with the WAZA ISB Coordinator regarding the performance of an ISB keeper. This complaint must then be considered by the WAZA Committee for Population Management, which is charged with working to assist and resolve the situation and determining appropriate action up to and including the removal of the ISB from either the keeper or the institution.

Studbook Data Stewardship

As per resolution adopted at the 60th WAZA Annual Conference on 6 October 2005 in New York (USA), the data contained in ISBs are held under the stewardship of WAZA (an organigram of ISB management is included in the Appendix 1, page 8). The ISB keeper is the curator of the data and neither the ISB keeper nor the institution at which that person is employed is the owner of the dataset. ISB keepers should share studbook data outside the WAZA membership only when officially approached by reputable scientific institutions for research purposes and after a data-sharing agreement has been entered into. If ISB keepers about doubts, they can consult CPM by written to the International Studbook coordinator.

Appendix 1: Organigram of Studbook Management



WAZA: World Association of Zoos and Aquariums

CPM: Committee for Population Management

ISB: International Studbook

Species360: Formerly known as International Species Information System

IZY-ZSL: International Zoo Yearbook Office at the Zoological Society of London

Appendix 2: Studbook Keeper Requirements

Studbook keeping is a time-intensive and meticulous task, and requires knowledge, dedication and support. It is essential that new studbook keepers receive training in the principles of studbook keeping and population management as well as in the mechanics of compiling, validating and analysing studbook data. Equally important is continued support that provides encouragement and needed guidance in handling various technical and communication challenges.

There are two main tenets to keeping an international studbook. The *first* is to understand the philosophy and process behind keeping an effective studbook, such as the reasons for having a managed population for a given species; how to contact institutions for information; and how to collect, collate, validate and distribute the information. The *second* is to understand the mechanics behind using studbook software, including how to deal with partial data and recognising what information should be included in reports.

The recommended training protocol for a new studbook keeper is completion of a formal studbook-keeping course conducted by a recognised regional association or other *ex situ* conservation organisation (e.g. CPSG, Species360). An alternative approach that can take place before, after or in place of a formal training programme is training through partnership with a mentor experienced in the principles and mechanisms of studbook keeping. Such mentoring opportunities are encouraged following formal training courses to promote the retention of newly learned skills and to sustain interest and motivation. All training efforts, whether formal or informal, should include all steps of studbook keeping.

The applicant should thus address the following questions:

- Detail any previous regional or international studbook keeper experience that you have had;
- Detail any relevant animal record keeping or management experience that you have had;
- Detail any studbook keeping or population management courses that you have taken, either through a regional association or from a related *ex situ* conservation organisation;
- List any other studbook keepers or population management advisors at your institution who might serve as a mentor or advisor to you in studbook-related issues;
- If you have not taken a studbook-training course or maintained an active studbook, outline how you intend to acquire these skills within the next year (e.g. participate in a formal training course, work extensively with a local mentor).

Appendix 3: Application for a New International Studbook

Date submitted:

Scientific and common name of taxon:

Applicant's name:

Applicant's e-mail, telephone and fax (if available):

Applicant's institution, including mailing address:

Explain why an international studbook (ISB) is necessary for this species, what the key usage will be, and which regions stand to benefit from the ISB (maximum of three pages), including:

- Status of species in the wild, including IUCN Red List of Threatened Species, CITES and/or Convention on Migratory Species listings, if applicable;
- Number of current holding institutions and current number of specimens held *ex situ* as per Species360 database; total number of specimens on Species360 database living and dead;
- Number of current holding institutions and current number of specimens held *ex situ* from other sources;
- Summary of reproductive history of species in human care;
- Husbandry problems of species (including any known health issues);
- Known inbreeding and/or hybridisation problems of species;
- How will this ISB improve the management of the species' *ex situ* population regionally and/or globally?

Applicants are expected either to have expertise or training in studbook keeping, or to acquire such expertise through training courses, mentoring by an experienced individual or other mechanism within one year of ISB approval (see Appendix 2, page 9).

Attach the following documents to this application:

- A signed Statement of Commitment by the applicant and the applicant's institution (included in the Appendix 5, page 12);
- Written approval of the ISB application from the relevant regional association(s) and/or the appropriate wildlife authority;
- The applicant's CV, including professional experience, academic qualifications and any other relevant information.

Please return the completed form to the WAZA International Studbooks Coordinator (conservation@waza.org).

Appendix 4: International Studbooks Distribution List

PDF copy of your studbook

Provide a copy of your ISB document to these authorities, preferably in PDF format via e-mail.

1. All institutions and regional associations that hold the species and provide data to the ISB keeper. **Regional studbook keepers and coordinators** for the species, if any.

2. IUCN/SSC Conservation Planning Specialist Group [office@cpsg.org]

3. IUCN/SSC taxonomic specialist group chair, if applicable. Consult this link for assistance: <https://www.iucn.org/commissions/ssc-groups>

PDF copy of your studbook and a copy of your dataset

Provide a copy of your ISB document and a copy of your dataset to these contacts:

1. WAZA Executive Office

Martín Zordan - [conservation@waza.org]

WAZA International Studbooks Coordinator

Laurie Bingaman Lackey - [laurie@eaza.net or giraffe3@bellsouth.net]

WAZA International Studbooks & GSMPs Advisor

2. International Zoo Yearbook Office at the Zoological Society of London

Fiona Fiskén - [fiona.fisken@zsl.org]

Managing Editor, International Zoo Yearbook.

3. Species360 [support@species360.org]

Appendix 5: Statement of Commitment

Studbook Keeper	
As keeper of the [insert taxon] international studbook, I am willing and able to devote the necessary time to create and maintain this studbook during my employment at the below institution.	
Name of applicant (please print):	
Signature of applicant:	Date:
Institution	
The [insert institution] commits itself to providing adequate time, resources and financial support for the establishment, maintenance and publication of the [insert taxon] international studbook. This institution also assures the continuation of support or responsible transfer to another qualified institution in the event that the above studbook keeper can no longer continue with his or her studbook duties.	
Name of director or governing official (please print):	
Signature of director or governing official:	Date:

Please return the completed form³ to the WAZA International Studbooks Coordinator:
conservation@waza.org

³An editable Word version of this form is available from the WAZA International Studbooks Coordinator.

Appendix 6: Statement of Transfer

Studbook Keeper	
Having moved from the [insert former institution] to the [insert current institution] as of [insert date], I wish to transfer responsibility for the [insert taxon] international studbook to my current institution.	
Name of applicant (please print):	
Signature of applicant:	Date:
Institution	
The [insert former institution] agrees to transfer responsibility for the [insert taxon] international studbook to the [insert current institution].	
Name of director or governing official of the former institution (please print):	
Signature of director or governing official:	Date:

Please return the completed form⁴ to the WAZA International Studbooks Coordinator:
conservation@waza.org

⁴An editable Word version of this form is available from the WAZA International Studbooks Coordinator.

Appendix 7: International Studbooks transfer flow chart



*Special thanks to Stephanie Sanderson, Tracy Rehse and Kathy Traylor-Holzer for creating this flowchart.