

Amphibian Data Entry Guidelines

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INTRODUCTION

Amphibian life history characteristics can make data entry challenging. Large clutch sizes and an assortment of life stages can generate data entry inconsistencies within and among institutions and studbooks. As many AZA institutions currently hold amphibians, it is becoming clearer that these data can be recorded in a multitude of ways. The following guidelines will clarify amphibian data entry for both institutional registrars and studbook keepers.

Consistent recording of amphibian data entry can improve husbandry and population management for these populations in zoos and aquaria. Incomplete and inaccurate data can lead to inappropriate husbandry practices or management recommendations. Cooperative management among these institutions is the key to maintaining these populations. Current amphibian studbook keepers and institutional record keepers were surveyed for their current amphibian data conventions. This document is based on many of these currently used conventions. These are the first guidelines for amphibian data entry, so they may be used as a template or starting point for others around the world.

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USE OF GUIDELINES

The following amphibian data entry guidelines were created with both AZA registrars and studbook keepers in mind. Some Species Survival Plans (SSP), Population Management Plans (PMP), or conservation programs may have data conventions already in place, but amphibian data entry is not consistent across all institutions or populations. Institutional registrars create numerous amphibian-related reports (taxon, specimen, inventory, to permits, etc.) for SSP, PMP, and non-program amphibian populations, but because data entry is not standardized, it is difficult to compare reports. In all cases, it may be helpful for registrars and studbook keepers to be aware of the other's responsibilities in entering amphibian data.

This document was created as a reference for everyone working with amphibian data, no matter which software is used (ARKS4, Microsoft Access or Excel, PopLink, SPARKS, etc.). We expect that Program Leaders, Studbook Keepers, TAG Steering Committees, or institutions may come up with data entry conventions for their populations that reference this document and can be easily shared with others.

Each of the following Management Types provides a set of data entry protocols. Each protocol lists all acceptable options for recording the specific type of data listed. In some cases, there is only one option. However in others, the most ideal option is listed first and then followed by other options that are less ideal as far as data are concerned, but may involve less intensive data gathering techniques or staff time.

For example:

- Perhaps Amphibian Species A should use Protocols 1a, 2b, 3a, 4a, 5b, etc. because the individual amphibians are easily individually identifiable throughout their entire lives.
- In comparison, perhaps it would make the most sense for Amphibian Species B to use Protocols 10a, 11a, 12ai, etc. because it is a group managed species that cannot be individually identified.

MANAGEMENT TYPES

Whether you use ARKS, Microsoft Access or Excel, SPARKS, PopLink, TRACKS, ZIMS, or your own in-house database, amphibian data for a particular species should ideally be entered consistently across institutions. Amphibian management, and in turn data entry, can be broken down into three types – Individually, as Groups, and Both Individually and as a Group.

- I. Recorded '**Individually**' indicates that every animal is individually identifiable and has a unique ID, and/or is physically isolated for all life stages.
- II. Recorded '**As Groups**' indicates that animals are identified with some type of group identification, not individually.
- III. Recorded '**Both Individually and as a Group**' indicates that depending on life stage or other factors, some individuals or life stages may be individually marked and have unique IDs while other individuals or stages of an individual's life are recorded as part of a group. Often individuals in this situation are recorded as groups for the first part of their lives and then later individually identified once they reach a specific life stage.

RECORD KEEPING FOR INDIVIDUAL MANAGEMENT – every animal is individually identifiable and has a unique identity, and/or is physically isolated for all life stages.

PROTOCOL 1: Individual Identification

- a. Identify and mark, if possible, using any reasonable method – transponders, photographs of physical characteristics, separate enclosures, etc. – to identify all individuals and assign an individual ID

PROTOCOL 2: Adding Individuals to Records

- a. At hatch or live birth
- b. Once they metamorphose, if applicable

PROTOCOL 3: Parentage of Individuals

- a. Sire and dam should always be recorded, if possible
- b. All potential sires and dams in enclosure at the time of conception should be recorded

PROTOCOL 4: Sex of Individuals

- a. Sex should be recorded for each individual, if and when known

PROTOCOL 5: Birth / Hatch Date of Individuals

- a. Date of egg hatch or live birth
- b. Estimate if necessary

PROTOCOL 6: Individual vs. Clutch Birth / Hatch Dates

- a. Each individual is given a specific birth/hatch date, regardless of when clutch mates hatch/are born
- b. All clutch mates are given the same birth/hatch date

PROTOCOL 7: Transfer Events of Individuals

- a. Only when moved to a new institution

PROTOCOL 8: Enclosure Composition for Individuals

- a. At an institutional level, record which individuals live in the same enclosure (i.e., who is housed with whom) and record moves to/from enclosures containing the same species
- b. At a studbook level, these data can be very important (e.g., can be used to determine potential parentage of offspring born/hatched in this enclosure), but there is not a specific location for entering this information in most studbook software. This could be entered as a User Defined Field (UDF) or Specimen Note.

PROTOCOL 9: Date and Cause of Death of Individuals

- a. Add death event with date and location of death
- b. Note cause of death (e.g., cause of natural death or a managed cull)

PROTOCOL 10: Additional Events, Activities, or Notes to Record for Individuals

- a. Capture from wild
 - i. Record site location, date of collection, number of individuals, sex ratio of individuals, life stage of individuals, and possible relationship to other wild caught individuals (i.e., several caught from the same location), if possible
- b. Environmental changes (e.g., temperature, humidity, etc.)
- c. Introduction of new animals into group (e.g., adding individual(s) of the same species or a different species to a group)
- d. Link group records between institutions, if inconsistently identifying by group or individual
- e. Merging groups (e.g., joining two or more groups to form one larger group)
- f. Outbreaks of disease
- g. Release to the wild
- h. Splitting group (e.g., splitting one large group into two or more smaller groups)
- i. Transferring group within an institution (i.e., moving them to a new enclosure, building, etc.)

RECORD KEEPING FOR GROUP MANAGEMENT – animals are identified with some type of group identification throughout their entire lives, never individually.

PROTOCOL 11: Group Identification

- a. Assign an identification number to an each group; may be based solely on separate enclosures, etc.

PROTOCOL 12: Adding Offspring or Number of Offspring to Group Records

- a. Add to records
 - i. At hatch or live birth
 - ii. Once they metamorphose, if applicable
- b. Number of births/hatches in each group should be recorded
 - i. Census initial number of offspring and number that make it to each life stage until adulthood
 - ii. Census initial number of offspring number that make it to each life stage until they are split into different groups

PROTOCOL 13: Parentage of Groups

- a. Sire and dam should always be recorded, if known
- b. All potential sires and dams in enclosure at the time of conception should be recorded
 - i. Studbook – record separate MULT# for each individual parent with a note indicating all potential sires and/or dams in enclosure (e.g., MULT1 = a few specific individuals that could be the potential sires, MULT2 = a different composition of animals that could be the potential dams)
 - ii. Institutional Records – record any individual, group number, genetic material, or a possible parents note for potential sires and/or dams in enclosure
- c. The number of males and females from within the group that are reproducing should be recorded whenever a new clutch is born/hatches
- d. The number of reproductively mature individuals from within the group that could possibly be reproducing should be recorded whenever a new clutch is born/hatches

PROTOCOL 14: Birth / Hatch Dates within Groups

- a. Date of egg hatch or live birth
- b. Estimate if necessary

PROTOCOL 15: Clutch Birth / Hatch Dates within Groups

- a. Each individual is given a specific birth/hatch date, regardless of when clutch mates hatch/are born (e.g., x number are born/hatched on one day, y number on the 2nd day, and z number on the 3rd day)
- b. All clutch mates are given the same birth/hatch date

PROTOCOL 16: Generation Number, if possible

- a. Number of generations from the wild (e.g., founder, F1, F2, etc.) should be recorded
- b. Family lineages or family groups should be tracked

PROTOCOL 17: Group Census and Composition (who is housed with whom)

- a. Sex ratio of group (i.e., number of males, females, unknown sex individuals) and number of individuals in each life stage (e.g., eggs, metamorphs, adults, etc.)
- b. Numbers for each group should be recorded regularly, as determined by the Studbook Keeper, Program Leader, or Institution
 - i. Weekly
 - ii. Monthly
 - iii. Yearly
 - iv. Opportunistically (e.g., when exhibits are broken down or groups are moved)
- c. Census Method
 - i. Use exact census numbers whenever possible
 - ii. If exact numbers are not possible, record estimated numbers with a note indicating the method of estimation

PROTOCOL 18: Additional Activities, Events, Notes, or Visits to Record for Groups

- a. Death date and cause of death (i.e., indicate if death was due to various natural causes or a managed cull)
- b. Developmental / life stage event
- c. Capture from wild
 - i. Record site location, date of collection, number of individuals, sex ratio of individuals, life stage of individuals, and possible relationship to other wild caught individuals (i.e., several caught from the same location), if possible
- d. Environmental changes (e.g., temperature, humidity, etc.)
- e. Group composition changes
 - i. Introduction of new individuals into group (e.g., adding one or more individuals of the same species to a group or adding one or more individuals of a different species)
 - ii. Merging groups (e.g., joining two or more groups to form one larger group)
 - iii. Splitting a group (e.g., splitting one large group into two or more smaller groups)
- f. Link group records between institutions, especially if inconsistently identifying by group or individual
 - i. If a new institution records group members as individuals, record the group number in each individual record
 - ii. If a new institution records individuals as a group, record all individual IDs in the group record
- g. Outbreaks of disease
- h. Release to the wild
- i. Reproductive event, other than birth/hatch (e.g., amplexus or breeding behavior)
- j. Transferring group to a new enclosure/tank

RECORD KEEPING FOR BOTH GROUP AND INDIVIDUAL MANAGEMENT – depending on life stage or other factors, some individuals or life stages may be individually marked and have unique IDs while other individuals or stages of an individual's life are recorded as part of a group. Often individuals in this situation are recorded as groups for the first part of their lives and then later individually identified once they reach a specific life stage.

PROTOCOL 19: Programs use different life stage milestones to change from recording a group to individual identification, but should be recorded individually as soon as possible and consistently for the entire population.

- a. Reach froglet, toadlet, tadpole, or juvenile stage
- b. Reach adult stage
- c. When transpondered
- d. When physically individually identifiable
- e. When begin being housed separately

PROTOCOL 20: Some populations may have instances where individually identified amphibians are changed to group identified populations, but should be recorded individually as long as possible, but consistently for the entire population. Some examples of these instances are:

- a. Individuals are no longer physically individually identifiable
- b. Can no longer be housed separately
- c. Individuals are moved to a new institution where they will be group managed
 - i. If a new institution records group members as individuals, record the group number in each individual record
 - ii. If a new institution records individuals as a group, record all individual IDs in the group record

PROTOCOL 21: Individual Institutional Identification after Medical Treatment

- a. Only if an animal is individually identifiable or kept separately thereafter
 - i. Could also be used to temporarily identify an individual due to separation, but will no longer be, or need to be, individually identifiable once added back into the group
- b. Add a brief explanation about the affected individual in the group text entry

For additional protocols for those species with both individual and group management, see previous sections on individual and group management that could also apply to these amphibian species.

REFERENCES

- Ballou J.D. and Foose T.J. 1996. Demographic and genetic management of captive populations. In Kleiman D.G., Lumpkin S., Allen M., Harris H., Thompson K. (eds.) *Wild Mammals in Captivity*. Chicago, IL: University of Chicago Press. p. 263-283.
- Ballou J.D. and Lacy R.D. 1995. Identifying genetically important individuals for management of genetic diversity in pedigreed populations. In Ballou J.D., Foose T.J., Gilpin M. (eds.) *Population Management for Survival and Recovery*. New York, NY: Columbia University Press. p. 76-111.
- Frankham R., Ballou J.D., and Briscoe D.A. 2002. *Introduction to Conservation Genetics*. Cambridge, UK: Cambridge University Press.
- Lacy R.C. 1995. Clarification of genetic terms and their use in the management of captive populations. *Zoo Biology* 14:565-577.
- Princée F.P.G. 1995. Overcoming the constraints of social structure and incomplete pedigree data through low-intensity genetic management. In J.D. Ballou, M. Gilpin, and T.J. Foose, eds., *Population management for survival and recovery. Analytical methods and strategies in small population conservation*, pp. 124-154. New York, Columbia University Press.
- Population Group Management Workshop; 2002 May 16-18; Seattle, Washington. Association of Zoos and Aquariums; 2002.
- Schad, K., editor. 2008. Amphibian Population Management Guidelines. Amphibian Ark Amphibian Population Management Workshop; 2007 December 10-11; San Diego, CA, USA. Amphibian Ark, www.amphibianark.org. 31 p.

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