ROYAL MELBOURNE ZOOLOGICAL GARDENS

KEEPER'S ANIMAL RECORDS MANUAL

This document is intended as an animal records resource for staff at Melbourne Zoo. It contains information about animal records systems, ISIS software utilised for record-keeping, and species management in the Australasian region.

Produced by Sjoukje Vaartjes, Animal Records Officer
Melbourne Zoo - 2006

ROYAL MELBOURNE ZOOLOGICAL GARDENS – KEEPER'S ANIMAL RECORDS MANUAL

CONTENTS

INTRODUCTION

This is the second edition of an Animal Records Manual for the Melbourne Zoo; it is designed specifically for use by Animal Keepers. The intention is for every section to keep at least one copy of the manual in the section office, which can be utilised as a standard reference.

This Manual aims to cover the basics – about keeping records, the computer programs in use and some species management information. Most keepers will already be familiar with the majority of the information provided in this manual, however it should provide a useful source reference when accessing the ISIS programs through the section computers.

The format of the Manual comes from a manual produced by Suzy Barlow at the Adelaide Zoo. She has allowed it to be copied and adapted for use by other ARAZPA Institutions.

The objective is to increase knowledge and understanding amongst animal staff about our Animal Records systems; and thus improve the quality and quantity of our data recording. It will also provide staff with a clearer picture of how the region works and why the entries made on Daily Reports are so vital to the 'bigger picture' from a Species Management perspective.

June 2006
Sjoukje Vaartjes
Animal Records Officer
Melbourne Zoo

THE BASICS OF RECORD-KEEPING

WHY KEEP RECORDS?

Good records maintain and transmit accurate information about the animal collection so that the information:

- **Documents a complete history of each animal owned by or kept at our facility.** The inclusion of identification numbers at former and subsequent institutions links your specimen records to those of other institutions, expanding the known history of that specimen.

- **Provides meaningful archival material for the future.** Data accumulated on many individuals is more useful than information on a single individual of a species. By maintaining comprehensive information about all specimens held, meaningful analyses are possible.

- **Provides legal documentation, including proofs of title and reports for permits.** Complete records and files of correspondence, permits, and agreements corroborate justification of actions, or aid in defence in legal proceedings.

- **Provides genetics history (pedigree) and basic demographic information used in local and global species management.** With species disappearing daily, zoological institutions and aquariums are striving to maintain stable captive populations embodying the genetic representation needed for future release of animals into their native habitats.

- **Provides data for research and husbandry.** Research depends on data, and the record- keeper's files can provide information increasingly referenced in developing and improving husbandry practices.

TAXONOMY

Taxonomy is the science of classification: categorising living things according to differentiating characteristics. The chart on the following page shows the major divisions in the taxonomic system, going from kingdom (the broadest, most general division) to the sub-species (a single kind of living organism). The chart is set up to show how a mammal (Siberian Tiger) and a bird (Andean Condor) are classified.

Taxonomy is by no means a 'static study' there are still on-going discussions about how animals should be identified and names are changed occasionally.

(The classification of species at Melbourne Zoo follows the standards in use by ISIS/ARKS and ARAZPA).

SCIENTIFIC/COMMON NAME

When corresponding with another institution, scientific names should be used along with common names so that the other institution will know exactly how the specimen was identified.

The common name chosen for a species can be quite confusing since animals sometimes acquire very localised names. *Felis concolor* is variously called panther, puma, Mountain lion, catamount, cougar and painter. As with the scientific name, a list of synonyms used for the common name should be included in the record file. Whatever name is chosen, it must be used consistently within the institution.

The correct way to write a scientific name is in Italics with the first letter of the generic name (or Genus) in upper case, and the whole of the species name in lower case (followed by the subspecies name in lower case if appropriate):

Eg: Eastern Barred Bandicoot   *Perameles gunnii*

RECORDING NUMBERS/SEXES

Zoos use an internationally recognised standard when reporting numbers and sexes of each species. As follows:

```
1.  1.   1
|   |    |
|   |    └──────►  Male
|   └──────────►   Female
└─────────────────►   Unsexed
```

3.0	=	3 males
0.4	=	4 females
0.0.5	=	5 unsexed
1.2	=	1 male and 2 females
1.3.1	=	1 male, 3 females and 1 unsexed.

TAXONOMY CHART

KINGDOM	PHYLUM	CLASS	ORDER	FAMILY	GENUS	SPECIES	SUBSPECIES

```
                        ┌─FISH

          ──INVERTEBRATES├─AMPHIBIANS
                        │                 ┌─FALCONIFORMES-----CATHARTIDAE    Vultur      gryphus
                        │                 │
                        ├─REPTILES        │                                  Andean condor
ANIMALIA│               │                 │
        │               │                 │
        │               │                 │
        └──VERTEBRATES──┼─BIRDS───────────┘
                        │                 ┌─CARNIVORA─────── FELIDAE ─────── Panthera    tigris      altaica
                        │                 │
                        └─MAMMALS ────────┘                                  Siberian Tiger
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THE IMPORTANCE OF STANDARDISING INFORMATION; MARSUPIAL BIRTH-DATE DETERMINATION AS AN EXAMPLE.
By Carol Bach
Registrar, Taronga Zoo

INTRODUCTION

In my role as the ARAZPA Records Keeping Specialist Contact, a great deal of effort has been expended in standardising record keeping practices within the Australasian region. The underlying principle of these efforts is to create a consistent and accurate database upon which species management decisions can be based. Good records are the foundation of every good studbook.

The most challenging aspect of the standardisation of animal records has been the determination of birth-dates for marsupials. The lack of standard procedures hinders the integrity of the information on 120 marsupial species contained in the worldwide animal databases maintained by ISIS. But more importantly, it compromises the analysis of studbook data for the increasing number of marsupials under captive management plans. These plans depend on accurate demographic data, and the use of pouch emergence as a recorded birth-date is no longer an acceptable alternative nor consistent with methods used in other regions.

Change will mean more diligence on the part of keepers and record keepers. The most striking feature of marsupials is that they are born in an embryonic condition; tiny, naked and with the hind limbs and tail still undeveloped (Strahan, 1992). The secretive reproduction of the marsupial is itself the reason for the difficulties in setting standards.

- The size of newly born pouch young makes them difficult to observe. They may be as small as a rice grain in the Antechinus, and are likely to go unnoticed unless the species is intensively managed.

- Pouch checking is intrusive by definition, but with proper techniques should not be dangerous to the animal or to the "intruder". It is often labour-intensive; the safe pouch checking of a healthy Tasmanian Devil or Wombat may require up to four keepers.

- A pouch young may not be safely removed from the teat for measuring during its early stages.

- Although much growth data exists, unless it also includes an observed birth from which to base the measure, this data is not useful in establishing standards.

- Witnessing a birth event is both luck and very careful observation. Births may be preceded by pouch-cleaning activities in some species, and followed with a slime trail from the cloaca to the top of the pouch.

- Measurement determinations can also be sex-specific. Some species, such as the Koala, show sexual dimorphism while still in the pouch. Because of its long pouch life, the Koala may prove more difficult to standardise than other species.

The most widely accepted standard of measure for very young joeys is crown-rump length. Head length was found by most researchers to be the most accurate measure of age (Hinds and Tyndale-Biscoe 1994) (Poole, Carpenter and Wood 1982). Others researchers used growth milestones almost exclusively. The literature showed a tendency to use foot length in

macropods and tail length in possums, and the list of body parts included the ear, arm, leg, knee-to-heel, manus, and scrotum. Accurate birth-date determination may require more than one measure over a period of time.

The enormity of the task of measuring pouch young for the mobs of macropods held at open-range zoos has been a problem. The demographic data collected now (or lack of it) may heavily impact the management of a species in years to come. The accepted practice at most open-range facilities is to catch up young joeys at the young-at-foot stage when they can still be associated with their dam for tagging purposes. The impetus must now be placed on keepers in this situation to also record proscribed head measurements of these joeys at this golden opportunity.

It is to the future generations of marsupials whose welfare depends on good animal records that this reference document is dedicated.

Carol Bach, Registrar
Taronga Zoo, 1997

ANIMAL/SPECIES MANAGEMENT COMPUTER PROGRAMS USED AT MELBOURNE ZOO

ARKS – ANIMAL RECORDS KEEPING SYSTEM

Background

The 'backbone' program for all other Animal Records programs. ARKS was originally written by ISIS (international Species Information System – see page 25 for the History of ISIS). It has been used widely since 1986 as a method of maintaining in-house animal records – today over 630 zoos worldwide are using this program.

On a regular basis, (done at Melbourne Zoo weekly), each zoo using ARKS sends a computer file by e-mail to ISIS (based at Minnesota Zoo, USA) updating it's previous animal records. Data that is sent includes the transaction, weights and ID areas of ARKS. The data is then downloaded onto a central computer database called ISIS3. This very powerful database can provide us with information about animals held in other ISIS participating zoos. This database can be accessed via the Internet, but DVDs are also sent out regularly to all participating institutions, which show us how many animals of which species are held at these other zoos, and we can also request information which might be needed to create a new studbook for a species (see SPARKS).

How it works

ARKS is institution specific ie: – it records only animals owned or physically present at Melbourne Zoo.

In ARKS we record an animal's in-house history, giving each animal an individual accession number as it is born or arrives in the collection. This number is used by the keepers when entering data onto their Daily Reports (Daily Reports books are kept in each animal section and copies are given to the Records Officer and the Vets at the end of each day – a hard copy remains in the section area). Information recorded includes enclosure data, banding or other identification methods, behaviours, breeding and medical data. This data is then entered onto the Records Officer's computer.

<u>**Example of a Daily Report entry:**</u>

Code	Sex	Species	ID	ARKS#	Encl.	Comment	Initial
MF	0.0.3	Scarlet-chested Parrot	Gold 46	991100	BD 6	Worming treatment	
			Gold 95	991096			SA
			Green 56	991097			

The codes used are ARKS codes used for entering the particular comment (see page 33 for a description of the codes). Enclosures each have a code corresponding to the section of the Zoo. In this case the enclosure is Bird Display Aviary 6.

The information recorded on ARKS is used in the daily management of the zoo's animals. For example, a duck may have to be caught for medical treatment and we can find out which duck it is by putting it's band number into the ARKS computer; once we have the ARKS ID, we can then check that bird's individual records and find out when it was hatched, how it was reared, and if this problem has occurred before, etc.

The quickest way to retrieve information in ARKS is by using the ARKS#, rather than the other forms of ID. Although they can also be used, the time taken is longer, as the program has to "look up" the data, going through EVERY individual record.

ARKS data is updated on our Zoo's internal network on a weekly basis, allowing everyone access to the most up to date information on our collection.

ARKS is also used to produce yearly Inventories of the collection for the Annual Report (which show how many animals there are in the collection, and how many were born, arrived, departed or died in the previous 12 month period); and in individual specimen reports which are sent with an animal if it is being moved to another zoo.

At Melbourne Zoo we also receive a vast number of enquires about our animals from members of the public, the media, volunteers, schools and other animal collections. Typical questions asked could be; "How many gorillas have you got? How old are they? How many males and females? Which ones were born in the Zoo? Who are their parent?" ARKS can answer these questions very quickly.

EGGS - EGG DATA COLLECTION AND ANALYSIS SOFTWARE

EGGS was developed by Laurie Bingaman-Lackey for use by ISIS members.

EGGS is a data collection system for individually identifiable animal eggs.   It works in conjunction with ARKS2 or ARKS3 and/or SPARKS. Whilst we now use the windows based ARKS4 – data is transferred back to ARKS3 on a weekly basis (MedARKS can only access ARKS3).

This program is used primarily at Melbourne Zoo to record Reptile egg clutches. It can record success rate, individual egg data such as weight and length, time and temperature of incubation.

After hatching, it also links into ARKS, using the same ARKS# as the animal is given on hatching. This can also be updated periodically to update sexes of the hatchlings.

It has proved useful for the Reptile Department to view the success of certain individuals and species for captive breeding.

MedARKS – MEDICAL ANIMAL RECORDS KEEPING SYSTEM

Also written and distributed by ISIS. The Veterinary Department uses MedARKS in conjunction with ARKS. The same animal accession number is used by the Veterinary Department as is already installed on ARKS. The vets can then report medical data from Daily Reports and their own records onto MedARKS. This is a specialised database which allows specific data to be recorded ie anaesthesia records, parasite screening etc.

SPARKS – SINGLE POPULATION ANIMAL RECORDS KEEPING SYSTEM

SPARKS is species specific – recording data for all specimens of a single species regardless of the institutions they are in, in the form of a Studbook. Studbooks are now maintained for most of the more endangered species in our region (Australasia). Studbooks are also maintained internationally; so often one animal will have a regional studbook number and an international studbook number. These are also recorded in the ARKS ID section of an animal's record. On SPARKS, each animal of one species is allocated a studbook number and once all the relevant data has been entered onto the computer, it can

be run through various programs (eg; DEMOG, GENES, PM 2000) which determine the best future captive breeding strategy; and which individuals in a population should be breeding in order to maintain appropriate genetic diversity for that species. The studbook keeper utilises this program to formulate a Captive Management Plan (CMP) and in conjunction with the zoos holding the species, can make recommendations regarding the management of our captive animals.

REGASP – REGIONAL ANIMAL SPECIES COLLECTION PLAN

Zoos in each area of the world have formed themselves into geographical regions. For example the EEP (European Species Management Plan) in Europe and our own region which has formed the ASMP (Australasian Species Management Program). In these regions, zoos are cooperating to manage their animals by creating animal collection plans appropriate to each area.

REGASP has been designed to assist in the development and implementation of our Regional Collection Plan (our region being Australasia). The Regional Collection Plan basically indicates how many animals of each species each zoo currently holds (ie a census), and what it aims to be keeping in the future. This data is published annually by ARAZPA (Australasian Regional Association of Zoological Parks and Aquaria) in the form of the Regional Census and Plan. The region has prioritised species, which are native to our region and threatened in their natural habitat. For example the Greater Stick-nest Rat is an AMSP category 1 – "Cooperative Conservation Program Species – high level regional management with the captive population managed as part of a wildlife agency species recovery program"

Example of a REGASP record (from the 2006 Regional Census and Plan):

Northern Quoll	*Dasyurus hallucatus*		
ADELAIDE	0. 0. 0	1. 2. 0	ACQUIRE IN 2006
CURRUMBIN	4. 6. 0	3. 3. 0	MAINTAIN
HALLS GP	1. 1. 0	1. 1. 0	MAINTAIN
HEALESVIL	1. 1. 0	1. 0. 0	MAINTAIN
PALMGROVE	0. 0. 0	1. 1. 0	ACQUIRE LONG TERM
PERTH	0. 2. 0	0. 2. 0	MAINTAIN IN 2006
SYDNEY	0. 1. 0	1. 1. 0	ACQUIRE
WINNELLIE	8. 8. 0	0. 0.80	AS PER TAG RECOMMENDATIONS; BREEDING PROGRAM IN 2006
Totals	14.19.0	8. 10.80	

IUCN Lower Risk
ASMP Monotreme & Marsupial TAG; No Regional Program ; Management Level 3
Planned category: Population Management Program; Management Level 1b

The first column indicates current stock (at time of printing), the institution's preferred stock and their implementation plan.

The central database for the REGASP system was previously located at the ARAZPA offices in Taronga Zoo, Sydney. It was initially developed as part of the species management program of the Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) for use by zoos and aquaria in Australasia. This program is now circulated worldwide by ISIS, and has therefore become a global collection plan. Participating ISIS institutions send a computer file by e-mail to the ARAZPA Office (based at Taronga Zoo) annually, updating their previous collection data. The REGASP program is simply updated by running an ARKS to REGASP data transfer which is done by the Records Officer.

PURPOSE

REGASP facilitates collection planning. It informs the decision making process including the complex of decisions made daily at all levels within an organisation and the decisions made jointly by organisations within a region or worldwide.

By using REGASP, zoos and aquaria can develop and implement plans for their animal collections while making reference to regionally and globally produced collection recommendations.

REGASP uses the existing ISIS network to share collection-planning data around the globe and communicate regional and global planning information and recommendations.

INFORMATION

REGASP provides access to:

- current and planned holdings for all species and exhibits
- data from other zoos in the region and internationally
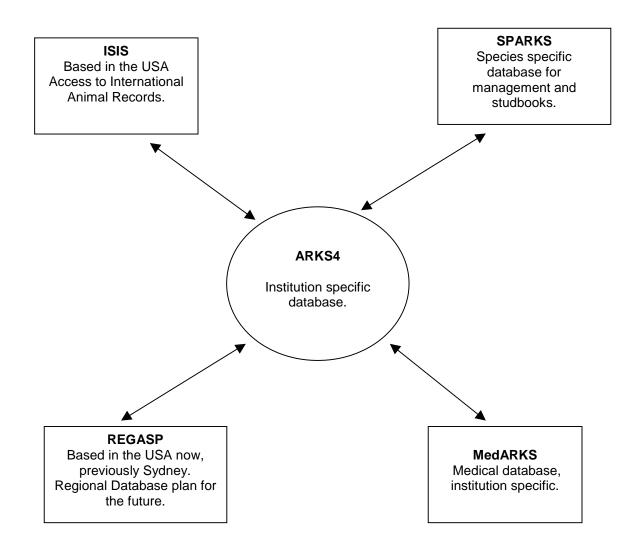- regional program material
- global planning data

TWO FORMS OF REGASP

REGASP comes in two forms, one which is implemented at zoo level and the other which is implemented regionally.

Data entered at zoo level is transferred to ISIS where it is combined into a global data set. The combined information is then made available to the zoo-based REGASP systems. By this means each zoo is kept up to date with the changing collections and plans of all other zoos in the region and globally.

The regional form, REGASP-Link, is used by regional associations to facilitate the development and communication of collection planning recommendations for a region's zoos and aquaria.

FLOWCHART OF COMPUTER PROGRAMS IN USE AT MELBOURNE ZOO

ISIS
Based in the USA
Access to International
Animal Records.

SPARKS
Species specific
database for
management and
studbooks.

ARKS4

Institution specific
database.

REGASP
Based in the USA now,
previously Sydney.
Regional Database plan for
the future.

MedARKS
Medical database,
institution specific.

HISTORY OF ISIS/ARKS

"ISIS itself began in 1973 when Drs Ulysses Seal and Dale Makey formally proposed to the American Association of Zoological Parks and Aquariums (AAZPA) and American Association of Zoo Veterinarians (AAZV) that such a system be started. Both organisations endorsed the proposal and offered start-up funding' the Minnesota Zoo offered to host the program. Major development funding was raised from the US Department of Interior and private foundations. Outside grants have continued to make up about half of ISIS' budget each year.

Fifty-five zoos in North America and Europe began pooling specimen data through ISIS in 1974. With continued support from the AAZPA, AAZV, and granting agencies, as well as endorsement by the International Union of Directors of Zoological Gardens (IUDZG), the system has grown at about one institution per moth, and covered about 70,000 living specimens in 222 zoological facilities in 16 countries at the end of 1986.

ISIS assembles studbook type data on thousands of captive species. Form this information base, reports are routinely distributed to participating facilities, covering census, breeding, age and sex distribution, and population trends. More detailed information on particular taxa can be retrieved on request – ie in a studbook format.

With so many institutions cooperating, and a data standard established, ISIS more recently acquired an additional role as a cooperative for in-house zoological software development.

ARKS 1
ANIMAL RECORDS KEEPING SYSTEM VERSION 1

The idea for computerised in-house animal inventory records system is (for computer history) quite old. To our knowledge, Denver, Tulsa, Los Angeles, US National and Philadelphia Zoological Parks had computer or work processor based systems before ISIS itself began operating in 1974. Some of their experience was shared through the then – extant AAZPA Computer Committee, providing important collective experience used in the construction of the initial (mainframe) ISIS system.

By 1981, as microcomputers became fairly common and relatively inexpensive, it began to seem possible to construct a fairly powerful but easy-to-use in-house system. Quite a number of institutions contacted the ISIS office about this, and began work on several prototype systems. The available microcomputers and software tools challenged the early builders, but by 1983 several facilities had useful systems (Topeka Zoological Park, Minnesota Zoological Gardens, Calgary Zoo and Henry Doorly Zoo – Omaha).

In addition, during this same interval, development took place on several mainframe and minicomputer systems (US National Zoological Park, San Diego Zoological Gardens, Canyon Colorado Equid Sanctuary, and Denver Zoological Gardens). These pioneers invested a great deal of time and effort and therefore expense. They have been generous in sharing their experiences with ISIS.

By the beginning of 1984 it was clear that development of such systems was a lot of work (and therefore costly), and that it was inefficient for each facility to build the needed software from "scratch". Conversations with William Conway of the New York Zoological Society and George Rabb of the Chicago Zoological Society – Brookfield identified common interest and a generous willingness to pool resources. ISIS, with its functioning mainframe pooled database system, seemed a logical choice as a development centre. Further important support was quickly forth coming from the Institute of Museum Services Conservation

Program and from David Bearman of the Smithsonian Office of Information Resource Management, on behalf of the US National Zoological Park.

The ARKS design process included two day visits and staff interviews at each of the three co-sponsoring institutions in the autumn of 1984. Core programming was followed by a joint design evaluation at the National Zoo, sponsored by the Friends of the National Zoo. Further revisions were made subsequently in response to four months of testing by several zoological institutions, and a final meeting of the test group. AAZPA's ISIS Operations Committee provided structured assistance in the testing process.

About 1.5 person years of effort (in the ISIS office) were invested in ARKS version 1.0 at a total cost of about US$60,000. Additional effort volunteered by others was considerable and valuable experience was shared with us. During the first year of release, ARKS version 1.00 evolved to version 1.10 as 9 successive modified versions were distributed. These included small improvements and fixed bugs as these were discovered and reported.

Sixty-nine zoological institutions in six countries adopted ARKS version 1. During 1986, ARKS became the most widely used collection records management software in the zoological garden, botanical garden and museum world. We very much appreciated the enthusiasm, support, patience and constructive criticism we received from users."

(SV note – in 2006 over 630 Zoos worldwide from 54 countries and over 1.5 million animals are recorded on the ISIS database).

(Reproduced from ARKS 2 Software Users Manual, 1987).

ARAZPA – Australasian Regional Association of Zoological Parks and Aquaria

ARAZPA was formally established on 3rd April 1990, at Auckland Zoo, New Zealand, and was incorporated in Victoria, Australia, on 30th April 1991. The mission statement is:

"*To harness the collective resources of zoos and aquariums to help conserve biodiversity in the natural environment*".

ARAZPA's recognised purposes are to:

- encourage the development of zoos and aquaria as conservation and education resources.
- encourage responsible stewardship of the species entrusted to the care of the profession
- facilitate effective communication and co-operation amongst zoo professionals and institutions
- give advice to, and co-operate with, agencies and institutions concerned with the zoo and aquarium profession
- provide appropriate advice to related organisations for the development of beneficial regional policies
- contribute to the development and operation of approved regional species management programs.
- encourage the development of high standards of management, conduct and ethics
- encourage and assist the professional development of zoological parks and aquarium staff.
- promote zoological parks and aquaria as cultural institutions of high standing

The Australasian Species Management Program (ASMP) is the species management arm of ARAZPA. The primary responsibility of the ASMP is to generate species management and collection planning recommendations for ARAZPA's institutional members throughout Australia, New Zealand and Papua New Guinea, in order to maximise the biological value and conservation impact of their animal collections.

ASMP Mission Statement

"*To plan and manage animal collections cooperatively, in ways that promote sustainability and contribute to species conservation.*"

The ASMP is internationally recognised as a world leader in the field of cooperative species management and animal collection planning. Participants in the ASMP form a communication network that has been specifically designed to facilitate regional and global coordination of zoo collection management. As a full participating member of the ASMP. Melbourne Zoo receives the following benefits.

Enhancement of Scientific Credibility

1. The ASMP is increasingly being viewed as a credible conservation-based program by the broad conservation community, including wildlife agencies in both Australia and New Zealand. ASMP Participating Institutions, including Melbourne Zoo, by virtue of their active involvement in their network are considered by wildlife agencies and other organisations as the "leading" zoos.

2. Participating Institutions benefit from joint representations made to wildlife agencies, in particular Environment Australia. By representing all members, the ASMP has been able to effect changes to transaction permit requirements and reporting procedures as well as to improve the working relationship between EA's Wildlife Protection Section and member zoos.

3. An institutions and peer review process for all ASMP documents containing species management recommendations is administered by the ASMP. This process ensures a standard approach to species management planning which utilises the most contemporary theories of small population management. The review process also provides an avenue for academic and wildlife agency input and support, crucial for enhancing the credibility of zoo-based species management programs including those involving Melbourne Zoo.

Technical and Scientific Support

4. A structure of regional Advisory Groups provides a network of some 70 ASMP position holders, each responsible for providing advice on particular areas of expertise. This structure of Taxon Advisory Group Convenors, Species Coordinators and Studbook Keepers coordinates the generation of species management and collection planning recommendations for all member institutions including Melbourne Zoo.

5. Training, technical material and assistance is provided to all position holders. In addition to ensuring a standard and scientifically sound approach to their regional work, position holders are able to apply the skills developed while operation within the ASMP to in-house species management activities. Melbourne Zoo currently has 19 position holders who have received guidance and support from the ASMP staff in the form of written resource material and personal tuition.

6. Animal Records Officers and Transaction Officers are supported through the activities of the ASMP Animal Records Keeping Specialist Group (AGRO). The work of this group has resulted in Australasia having arguably the most consistent and complete animal records of any region. The group has now turned its attention to increasing the quality and accuracy of the records kept by member zoos which will in turn enhance our ability to effectively manage our collections.

7. Melbourne Zoo is provided full access to the custom designed collection planning software, REGASP. This gives the current and planned holdings of all members along with regional and global TAG information necessary to effective decision making. The databases are updated monthly.

8. Staff are provided with comprehensive user support for the REGASP system and the electronic communications system. This is provided in the form of manuals, technical notes and verbal instructions.

9. Comprehensive user support is also provided to staff of ARAZPA Institutions using any of the other ISIS and associated specimens management software packages. These include: ARKS for animal records keeping; SPARKS, for the creation and analysis of studbooks; DEMOG for demographic analysis of captive populations; MedARKS, for the maintenance of detailed veterinary records; GENES for the generation of optimal mating recommendations; and CAPACITY, for the development of long-term breeding program objectives.

10. The global ISIS datasets are maintained in the ASMP offices allowing for the production of animal searches, reports and datasets for staff of ARAZPA institution on request. This database contains the pooled animal records of over 2,000,000 specimens from over 630 zoos around the world.

Planning Documents:

11. Participating Institutions have direct input into the formulation of Taxon Advisory Group collection planning recommendations aimed at developing closer integration between the animal collections of member institutions and enhancing the conservation objectives of those collections. These plans take into account the wild status of each species within the TAG, the appropriateness of each species to forming part of a captive collection, regional and global conservation objectives and the needs of member institutions.

12. ARAZPA institutions also have direct input into the formulation and ultimate approval of Captive Management Plans aimed at optimal management of target species within the region. These documents provide detailed analyses of the current genetic and demographic status of zoo populations of a target species, as well as projections of future captive populations using computer-modelling techniques. Such analyses provide the basis for sound species management recommendations.

13. Both regional and international studbook data on species managed within the region is provided.

14. ARAZPA institutions receive regular publications and reports on the activities of the ASMP. These documents are designed to allow members to judge progress in the area of regional species management and collection planning. They include:
    - ASMP Regional census and plan
    - ASMP Technical notes
    - quarterly Executive Officer Reports

15. ARAZPA institutions receive master copies of procedures manuals aimed at streamlining regional activities. These documents are updated in response to input from members. They include:
    - the ASMP Species Management Procedures Manual
    - Readings in Species Management
    - the Electronic Communications Manual
    - the ASMP Animal Records Keeping Procedures Manual.

Influence over program development

16. ARAZPA institutions are represented in the ASMP network at all levels. Opportunities to influence the direction taken by the program are provided at the level of the ARAZPA Board, the ASMP Committee, for ISIS member institutions, representation amongst TAG Convenors, Species Coordinators and Studbook Keepers.

17. Through the operations of the ASMP, member zoos maintain effective operational links with ISIS, the IUCN's Conservation Breeding Specialist Group (CBSG), and the World Zoo Organisation, allowing member zoos to have a direct impact on global species management and collection planning processes.

18. Finally, the operations of the ASMP are administered by staff with the collective zoo-based experience of Animal Keeper, Animal Records Officer, Transactions Officer,

Research Officer and Curator. ARAZPA staff members are committed to utilising their experience in the zoo community to heighten communication with and between ARAZPA institution. AS a result, the activities of the ASMP compliment standard zoo operations while providing an effective framework for regional cooperation in species management and collection planning.

ASMP PROGRAM OVERVIEW

The Australasian Species Management Program (ASMP) generates captive species management recommendations and collection planning recommendations for Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) institutional members throughout Australia, New Zealand and Papua New Guinea.

PARTICIPATING INSTITUTIONS

See the 2006 Regional Census and Plan for addresses and contacts of the current membership. Copies are held by each Curator, the Records Officer, the Director, the Coordinator of Collection Planning, and TAG Convenors (currently Amanda Embury – Primates and Patrick Honan – Invertebrates).

(Reproduced from ASMP Regional Census and Plan, 2006).

ANIMAL RECORDS – DAILY REPORT ENTRY GUIDELINES – 2006

INTRODUCTION

The purpose of the Animal records and Daily Report system is to provide easily retrievable information about the animals in the collection, so that they can be managed appropriately. This includes keeping records of total numbers and sexes of each species; individual identification, enclosure data, and all other information regarding behavioural, reproductive and medical details for each animal.

WHO RECORDS THE DATA?

Any keeper on a section who makes an observation (ie: behavioural, reproductive), moves an animal to a new enclosure, receives or transfers an animal in or out of their section, treats an animal etc.

WHERE IS THE DATA RECORDED?

All entries should be written on the Daily Report. Everything entered onto the Daily report (with the exception of Seal training – recorded at Seals) is entered onto ARKS. General notes made by keepers to keepers are not recorded.

WHAT DATA TO RECORD?

1. All entries MUST use the animal's ARKS#. It is also useful to enter a further ID, into that column on the Daily Report – eg: house name, tag etc. Sections are given an ARKS# update monthly by the Records Officer and can use this for quick reference when entering their data.

2. *BIRTHS/DEATHS/ARRIVALS/DEPARTURES* must be written up on the day that they happen.

3. *ENCLOSURE MOVES* using individual ARKS# for each animal (or if an entire group is moved – a note stating that all individuals of that species from that enclosure were moved) and the enclosure codes of the old and new enclosure.

4. *SEX* if a young animal was recorded as unknown sex at birth, a note should be written up as soon as positive sex identification has been made. Also how sex was established eg: visually for a kangaroo, probing for a reptile or DNA feather sexing for a bird.

5. *SEASONAL CHANGES* eg: bird moult.

6. *WEIGHTS AND MEASUREMENTS*. All weights and measurements should be recorded in a systematic manner. This includes both live animals and eggs. See Appendix III for information on standard measurements.

7. *REPRODUCTIVE*. All reproductive behaviour and female oestrous cycles

8. *BEHAVIOURAL*. There is always something to report in this area! For eg: a new animal arrives, or is mixed for the first time. Aggression, group behaviour, grooming etc. These records will be referred to in the future and should always to onto the Daily Report to be recorded on ARKS.

9. *MEDICAL.* When the animal is sick or off-colour. Follow up information on treatment, procedures, improvements etc. Basic information is recorded on ARKS such as type of treatment and length etc, (detailed information is recorded by the Vets onto the animal's medical record and MedARKS – such as dosage etc.).

WHERE THE INFORMATION GOES

The data recorded on the daily report is entered onto the ARKS system by the Records Officer. The network version of ARKS, which is available to each section, is updated weekly.

Inventory data is sent to ISIS on a weekly basis. This includes transactions (births deaths, arrivals), Identification and weight data. None of the enclosure or comments data is sent. This type of information is returned to each participating Zoo in the form of DVD, or via the Internet. This information contains data from each zoo and allows us to trace animals from other zoos, look up animals which have been offered to us etc.

The records are referred to all the time, both in-house and by other zoos, particularly by regional studbook keepers. What you record will stay on the specimen's individual record, and should that animal be transferred out of the zoo, a copy of that record accompanies the animal to it's new location. Keepers at other zoos will refer to this information to help them manage the animal.

DAILY REPORT CODES USED BY SECTIONS AND FOR DATA ENTRY

ACQ –   Acquisitions. Used by sections to record a new animal for their area. Includes public donations, rescue/rehab etc.

NA -   Acquisition Code for ARKS. Use to record information such as age, condition, origin etc.

NN -   Donor Code for ARKS. Use to record information on Donor – name, address, telephone, AC#.

B/H -   Birth/Hatching. Used to record a birth or hatching. Sections should include ARKS# for dam and sire, or note that they are unknown. Daily Report is sent back if it is not noted.
Code in ARKS for birth information note is "NB".

TAG -   Tagging/banding. Used to record bird bands, tattoos, house names, microchips etc. Leg bands, wing tags, ear tags, tattoos and microchips must also include a note of location eg: Right leg, Left ear, interscapular etc.

D/30 -   Death within 30 days of birth or acquisition. Code in ARKS for death information note is "NX".

D/E -   Death established (animal has been in collection longer than 30 days). ARKS code for post mortem information is "MN".

INT -   Internal transfers. Any movement of an animal from it's residing enclosure, be it within a section or outside a section. Both origin and destination enclosures must be recorded.

DIS -   Disposals. Used by sections to record releases and transfers to other Institutions. Code in ARKS for disposal information is "NO".

BREEDING

NE -   Age estimate code in ARKS. Use when age is estimated (eg: animal is ~ 5 weeks old). Also note why that age is chosen – eg: weight or lengths taken. Native Mammals should refer to the "Age Determination in Marsupials", Birds can refer to Appendix II for information on fledging times etc.

NP -   Possible parents code in ARKS. Use when exact parents are unknown, list possibilities (eg: female 990023, 980568).

PHYSICAL CONDITION

WT -   Used by keepers to record weights. Should include kg or g.

P -   Physical condition code in ARKS. Use to record notes on condition (eg: fair-poor).

PS -   Shed/Moult/Slough code in ARKS. Use to record snakes sloughing, seals moulting etc.

MEDICAL NOTES

MO -   Medical Observation code in ARKS. Used to record observations of injuries etc.

MP -   Medical Procedure code in ARKS. Used to record procedures (eg: change bandage, remove sutures, vet check etc).

MT -   Medical Treatment code in ARKS. Used to record treatments (eg: antibiotics etc).

MF -   Faecal check code in ARKS. Used to record taking of faecal samples, and their results.

MU -   Urine collection code in ARKS.

EG -   Egg information code in ARKS. Where possible number of eggs and their weights and lengths should be recorded. At hatching, record incubation lengths and temperatures/ humidity during incubation.

ANIMAL MANAGEMENT

Q -   Animal management note (eg: animals given access to display overnight).

QD -   Diet code in ARKS. Used to record changes in diet.

QE -   Environment conditions code in ARKS. Used to record weather, cage description etc.

QH -   Human interaction code in ARKS. Used to record training, handling etc.

QI -   Introduction code in ARKS. Used to record when animals are newly introduced to each other, for purposes other than breeding (see OB).

BREEDING MANAGEMENT

O -   Breeding management note.

OB - Breeding encounter code in ARKS. Used to record animals introduced for breeding purposes.

OS - Breeding separation code in ARKS. Used to record animals separated to prevent breeding.

OC - Contraception code in ARKS. Used to record contraception.

BEHAVIOUR

BG - Group behaviour code in ARKS. Used to record behaviour in a group rather than an individual.

BS - Individual behaviour code in ARKS.

B1 - Aggressive behaviour code in ARKS.

B2 - Territoriality behaviour code in ARKS.

B3 - Feeding behaviour code in ARKS.

B4 - Grooming behaviour code in ARKS.

B5 - Stereotypic behaviour code in ARKS.

B6 - Vocalisation behaviour code in ARKS.

REPRODUCTION

R - Reproductive note code in ARKS.

RA - Pre-copulatory behaviour code in ARKS. Used to record oestrous, courtship etc.

RC - Copulatory behaviour code in ARKS. Used to record breeding attempts, matings etc.

RM - Menstruation code in ARKS.

ANIMAL ACCESSION NUMBERS (ARKS NUMBERS)

The Melbourne Zoo started using the ARKS program in 1988 and adopted the internationally accepted standard for allocating animal accession numbers.

Our current system operates as follows:

Each animal is allocated a 6 digit number on birth or arrival at Melbourne Zoo.

The 6 digit number has the following two compositions:

1)   970062

97 indicates the year the animal was born or arrived at the zoo.

62 indicates that it was the 62nd animal to be born/ or arrive at the zoo in 1997.

This allows for up to 9999 animals to be added in any one year.

Since the turn of the new millennium, a different system has been adopted. If we had continued with the previous system, we would be using leading zeros – which can also be confused with animals that may have been accessioned in 1900. This has happened at several zoos where the Records Officer has entered historical records.

2)   To allow the ARKS number to still reflect the year an animal was born, the following has been adopted:

For the year 2000, the numbers will be **A00001, 2** etc.

For the year 2001, the numbers will be **A10001, 2** etc.

For the year 2002, the numbers will be **A20001, 2** etc and so on.

For the year 2010, the numbers will be **B00001, 2** etc.

Each Animal Section is given a specimen report of any new births or arrivals within a day of the Daily report being received by the Animal Records Officer. An ARKS# update report is generated monthly for each Animal Section which shows current stock holdings in an easy to read condensed format. This can be generated in a taxonomic order, or enclosure order, or even for each round within a section. Upon receipt of this report, **keepers are expected to check it for any discrepancies and inform the Records Officer of them**.

Royal Melbourne Zoological Gardens
Threatened Species 2005
(Australian species in bold)

COMMON NAME	*SCIENTIFIC NAME*	IUCN Category	Environment Australia Threat Category (EPBC Act 1999) – as of 2000	Victorian Threatened Fauna 2003
INVERTEBRATES				
Lord Howe Island Walkingstick	*Dryococelus australis*		Critically Endangered	
AMPHIBIA				
Axolotl	*Ambystoma mexicanum*	Vulnerable		
Southern Bell Frog	*Litoria raniformis*	Endangered	Vulnerable	Endangered
Stuttering Barred Frog	*Mixophyes balbus*		Vulnerable	Critically Endangered
Great Barred Frog	*Mixophyes fasciolatus*	Near Threatened		
Southern Corroboree Frog	*Pseudophryne corroboree*	Endangered	Endangered	
REPTILIA				
Philippines Crocodile	*Crocodylus mindorensis*	Critically Endangered		
Chinese Three-striped Box Turtle	*Cuora trifasciata*	Endangered		
Spiny Terrapin	*Heosemys spinosa*	Vulnerable		
Carolina Box Turtle	*Terrapene carolina major*	Near Threatened		
Red-eared Slider	*Trachemys scripta elegans*	Near Threatened		
Aldabra Giant Tortoise	*Aldabrachelys elephantina*	Vulnerable		
Elongate Tortoise	*Indotestudo elongata*	Vulnerable		
Asia Minor Spur-thighed Tortoise	*Testudo graeca ibera*	Vulnerable		

COMMON NAME	*SCIENTIFIC NAME*	IUCN Category	Environment Australia Threat Category (EPBC Act 1999) – as of 2000	Victorian Threatened Fauna 2003
Western Hermann's Tortoise	*Testudo hermanni robertmertensi*	Near Threatened		
Horsfield's Tortoise	*Testudo horsfieldii*	Vulnerable		
Broad-shelled River Turtle	*Chelodina expansa*			Endangered
Mary River Turtle	*Elusor macrurus*	Endangered	Endangered	
Grassland Earless Dragon	*Tympanocryptis lineata pinguicolla*		Endangered	Endangered
Reticulate Gila Monster	*Heloderma suspectum suspectum*	Vulnerable		
Fijian Banded Iguana	*Brachylophus fasciatus*	Endangered		
Fijian Crested Iguana	*Brachylophus vitiensis*	Critically Endangered		
Striped Legless Lizard	*Delma impar*	Vulnerable	Vulnerable	Endangered
Lace Monitor	*Varanus varius*			Vulnerable
Diamond Python	*Morelia spilota spilota*			Endangered
Carpet Python	*Morelia spilota variegata*			Endangered
Broad-headed Snake	*Hoplocephalus bungaroides*	Vulnerable	Vulnerable	
AVES				
Southern Cassowary	*Casuarius casuarius johnsonii*	Vulnerable	Endangered	
Glossy Ibis	*Plegadis falcinellus*			Near Threatened
Mandarin Duck	*Aix galericulata*	Near Threatened		
Freckled Duck	*Stictonetta naevosa*	Vulnerable		Endangered
Hardhead	*Aythya australis*			Vulnerable
Blue-billed Duck	*Oxyura australis*			Endangered
Lady Amherst's Pheasant	*Chrysolophus amherstiae*	Near Threatened		
Brolga	*Grus rubicunda*			Vulnerable
Inland Dotterel	*Charadrius australis*			Vulnerable

COMMON NAME	SCIENTIFIC NAME	IUCN Category	Environment Australia Threat Category (EPBC Act 1999) – as of 2000	Victorian Threatened Fauna 2003
Bush Stone-curlew	Burhinus grallarius			Endangered
Nicobar Pigeon	Caloenas nicobarica	Near Threatened		
Luzon Bleeding-heart	Gallicolumba luzonica	Near Threatened		
Diamond Dove	Geopelia cuneata			Near Threatened
Major Mitchell's Cockatoo	Cacatua leadbeateri	Near Threatened		Vulnerable
Red-tailed Black-cockatoo	Calyptorhynchus banksii			Endangered
Fischer's Lovebird	Agapornis fischeri	Near Threatened		
Chattering Lory	Lorius garrulus	Vulnerable		
Orange-bellied Parrot	Neophema chrysogaster	Endangered	Endangered	Critically Endangered
Scarlet-chested Parrot	Neophema splendida	Vulnerable		Vulnerable
Princess Parrot	Polytelis alexandrae	Vulnerable	Vulnerable	
Golden-shouldered Parrot	Psephotus chrysopterygius	Endangered	Endangered	
Masked Owl	Tyto novaehollandiae novaehollandiae			Endangered
Sooty Owl	Tyto tenebricosa			Vulnerable
Barking Owl	Ninox connivens			Endangered
Regent Honeyeater	Xanthomyza phrygia	Endangered	Endangered	Critically Endangered
Diamond Firetail	Stagonopleura guttata			Vulnerable
Star Finch	Neochmia ruficauda	Vulnerable	Endangered	
Java Sparrow	Padda oryzivora	Vulnerable		
MAMMALIA				
Greater Bilby [NT]	Macrotis lagotis sagitta	Vulnerable	Vulnerable	
Eastern Barred Bandicoot	Perameles gunnii	Endangered	Endangered	Critically Endangered

COMMON NAME	SCIENTIFIC NAME	IUCN Category	Environment Australia Threat Category (EPBC Act 1999) – as of 2000	Victorian Threatened Fauna 2003
Koala [Southern]	Phascolarctos cinereus victor	Near Threatened		
Long-nosed Potoroo	Potorous tridactylus tridactylus	Vulnerable	Vulnerable	Endangered
Goodfellow's Tree-kangaroo	Dendrolagus goodfellowi buergersi	Endangered		
Kangaroo Island Kangaroo	Macropus fuliginosus fuliginosus	Near Threatened		
Red Kangaroo	Macropus rufus			Near Threatened
Quokka	Setonix brachyurus	Vulnerable	Vulnerable	
Grey-headed Flying-fox	Pteropus poliocephalus		Vulnerable	Vulnerable
Ring-tailed Lemur	Lemur catta	Vulnerable		
Black-and-white Ruffed Lemur	Varecia variegata variegata	Endangered		
Golden Lion-tamarin	Leontopithecus rosalia	Critically Endangered		
Cotton-top Tamarin	Saguinus oedipus	Endangered		
Black-handed Spider-monkey	Ateles geoffroyi	Vulnerable		
Lion-tailed Macaque	Macaca silenus	Endangered		
Mandrill	Mandrillus sphinx	Near Threatened		
Hamadryas Baboon	Papio hamadryas hamadryas	Near Threatened		
Ebony Leaf-monkey	Trachypithecus auratus	Vulnerable		
Siamang	Hylobates syndactylus	Near Threatened		
Western Lowland Gorilla	Gorilla gorilla gorilla	Endangered		
Orang-utan	Pongo pygmaeus	Vulnerable		
Sumatran Orang-utan	Pongo pygmaeus abelii	Vulnerable		
Maned Wolf	Chrysocyon brachyurus	Near Threatened		
African Wild Dog	Lycaon pictus	Endangered		
Asiatic Golden Cat	Catopuma temminckii	Near Threatened		

COMMON NAME	SCIENTIFIC NAME	IUCN Category	Environment Australia Threat Category (EPBC Act 1999) – as of 2000	Victorian Threatened Fauna 2003
Fishing Cat	Prionailurus viverrinus	Near Threatened		
Lion	Panthera leo	Vulnerable		
Jaguar	Panthera onca	Near Threatened		
Leopard	Panthera pardus saxicolor	Endangered		
Sumatran Tiger	Panthera tigris sumatrae	Critically Endangered		
Snow Leopard	Uncia uncia	Endangered		
Small-clawed Otter	Amblonyx cinereus	Near Threatened		
Australian Fur-seal	Arctocephalus pusillus doriferus			Vulnerable
Sub-antarctic Fur-seal	Arctocephalus tropicalis		Vulnerable	
Red Panda	Ailurus fulgens fulgens	Endangered		
Asian Elephant	Elephas maximus	Endangered		
Malayan Tapir	Tapirus indicus	Vulnerable		
Pygmy Hippopotamus	Choeropsis liberiensis	Vulnerable		
Giraffe	Giraffa camelopardalis rothschildi	Conservation Dependant		
New Holland Mouse	Pseudomys novaehollandiae			Endangered
Patagonian Cavy	Dolichotis patagonum	Near Threatened		

Source of data:

IUCN Red List (http://www.iucn.org/)

Department of Environment and Heritage (EPBC Act List of Threatened Fauna - http://www.deh.gov.au/)

Department of Sustainability and Environment (Adivsory List of Threatened Vertebrate Fauna in Victoria - http://www.dse.vic.gov.au/)

Updated 19[th] July 2005

Compiled by Sjoukje Vaartjes, Animal Records Officer, Melbourne Zoo

EXPLANATION OF ASMP/CITES/IUCN/VPC CATEGORIES

ASMP (AUSTRALASIAN SPECIES MANAGEMENT PROGRAM) CATEGORIES

The efficient allocation of our limited resources requires that we prioritise species according to their relative need for regional management.

ASMP Status

Conservation Program
Programs in this category include specific conservation objectives that would initiate or assist efforts to support *in situ* populations of the target species. They may be single or multi-institution programs.
Examples - Philippine Crocodile, Tasmanian Devil.

Population Management Program
Population management programs are established for taxa which the TAG considers would benefit from some level of regional population management. Taxa should be held, or planned to be held, in more than one institution, and in population sizes of at least 20.
Examples – Western Lowland Gorilla, Black-winged Stilt.

Husbandry Research
There remain many taxa in zoos for which husbandry is insufficiently known for a managed program to be possible. Where the TAG feels that a taxon of this type is worthy of the investment of regional resources (usually those species held, or planned to be held, in more than one institution, in number > 20), this category is applied. The goal of the program is to establish and document husbandry techniques and information for the target taxon.
Examples – Brolga, Grey Nurse Shark.

Phase Out
This category indicates that the TAG has evaluated this taxon and sees no need for regional management or resourcing. Within and between-institution management may occur, but this is not coordinated or overseen by the ASMP. Taxa in this category may include, for example, those regularly acquired through rehabilitation programs.
Example – De Brazza's Monkey.

Not Recommended
This category is only for taxa not currently held in the region but flagged to be imported or collected from the wild. It is applied to taxa that the TAG has evaluated and has deemed not appropriate for the regional collection and/or detrimental to existing programs.

Not Evaluated
Where this category is assigned it indicates that the TAG has not yet evaluated the regional implications or needs of the taxon.

Management Level

Level 1 - Specimen-level management
Level 1 management is applied to taxa for which specimen-level records are routinely kept, and for which specimen-level manipulation of breeding pairs is possible and practical. Level 1 is further split into high and low intensity management:

1a   Indicates high intensity genetic and demographic management aimed at maximising gene diversity, minimising inbreeding and controlling reproductive rate. Programs are overseen by a species coordinator who prepares a strategic plan for the population and annual breeding recommendations, which institutions make a formal commitment to follow.
Examples – Macleay's Fig-parrot, Cotton-top Tamarin.

1b   Indicates low intensity genetic and demographic management aimed at minimising inbreeding and managing population size. Programs are overseen by a species coordinator, who provides guidance on appropriate reproductive rates and circulates lists of suitable pairings. Curators use this information to guide animal transfer arrangements and the formation of new pairs.
Examples – Swift Parrot, Rose-crowned Fruit-dove.

Level 2 - Group-level management
This level denotes group-level, lower-intensity genetic and demographic management and is applied where specimen-level manipulation of mating choices is impractical. Different schemes are available to meet different aims. Programs are overseen by a coordinator who selects and implements an appropriate scheme.
Examples – African Wild Dog, Brush-tailed Rock-wallaby.

Level 3 – Annual Census only
The census of current and planned holdings for the region is published in the body of the annual Regional Census and Plan document.
Examples: Common Iguana, Eastern Grey Kangaroo.

(Reproduced from ASMP Regional Census and Plan, 2006).

CITES CATEGORIES

CITES controls international trade in species in three categories

APPENDIX I – These are species threatened with extinction and that are, or may be affected by trade. Among the species listed are: apes, lemurs, the giant panda, many South American monkeys, great whales, cheetah, leopards, tiger, elephants, all rhinoceroses, many birds of prey, cranes, pheasants, parrots, all sea turtles, some crocodiles and lizards, giant salamanders, some mussels, orchids, cycads and cacti.

APPENDIX II – These are species that, although not threatened with extinction now, might become so unless trade in them is strictly controlled and monitored. CITES Appendix II also includes some non-threatened species, in order to prevent threatened species from being traded under the guise of non-threatened species that are similar in appearance.

APPENDIX III – These are species that any CITES Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation and that require the cooperation of other countries in the control of trade.

Each Party or member country of CITES is obliged to designate Management and Scientific Authorities.

Management Authorities are responsible for:

- authorising and issuing permits and certificates of approval;
- communicating information to other Parties and the Secretariat; and
- reporting on compliance matters and contributing to CITES Annual Reports.

The Management Authority for CITES in Australia is the Commonwealth Minister for the Environment and Heritage.

Scientific Authorities are responsible for providing scientific advice and recommendations to the Management Authorities. For example, Scientific Authorities can provide advice about:

- biological and trade information on species proposed for listing in the Appendices;
- suitable measures to limit export of specimens on Appendix I;
- the suitability of recipients of live specimens listed on Appendix I to house and care for them;
- whether a scientific institution meets the criteria for registration to exchange CITES-listed specimens;
- whether a facility meets the criteria for captive breeding or artificial propagation in accordance with CITES; and
- whether a management program for commercial harvested species from the wild is sustainable in accordance with CITES.

The Scientific Authority for CITES in Australia is the Secretary of the Commonwealth Department of the Environment and Heritage.

(Reproduced from Department of Environment & Heritage website – www.deh.gov.au)

IUCN CATEGORIES

These categories were revised in the 2001 (Version 3.1) edition of the red list, and consist of the following categories:

EXTINCT (EX)
A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

EXTINCT IN THE WILD (EW)
A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Criteria), and it is therefore considered to be facing an extremely high risk of extinction in the wild.

ENDANGERED (EN)
A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Criteria), and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU)
A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Criteria), and it is therefore considered to be facing a high risk of extinction in the wild.

NEAR THREATENED (NT)
A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)
A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

NOT EVALUATED (NE)
A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

THE CRITERIA FOR CRITICALLY ENDANGERED, ENDANGERED AND VULNERABLE

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild:
A. Reduction in population size based on any of the following:
   1. An observed, estimated, inferred or suspected population size reduction of 90% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
   (a) direct observation
   (b) an index of abundance appropriate to the taxon
   (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
   (d) actual or potential levels of exploitation
   (e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.
   2. An observed, estimated, inferred or suspected population size reduction of 80% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of 80%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of 80% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 100 km², and estimates indicating at least two of a-c:

a. Severely fragmented or known to exist at only a single location.

b. Continuing decline, observed, inferred or projected, in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) area, extent and/or quality of habitat

(iv) number of locations or subpopulations

(v) number of mature individuals.

c. Extreme fluctuations in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) number of locations or subpopulations

(iv) number of mature individuals.

2. Area of occupancy estimated to be less than 10 km², and estimates indicating at least two of a-c:

a. Severely fragmented or known to exist at only a single location.

b. Continuing decline, observed, inferred or projected, in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) area, extent and/or quality of habitat

(iv) number of locations or subpopulations

(v) number of mature individuals.

c. Extreme fluctuations in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) number of locations or subpopulations

(iv) number of mature individuals.

C. Population size estimated to number fewer than 250 mature individuals and either:

1. An estimated continuing decline of at least 25% within three years or one generation, whichever is longer, (up to a maximum of 100 years in the future) OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least

one of the following (a-b):

(a) Population structure in the form of one of the following:

(i) no subpopulation estimated to contain more than 50 mature individuals, OR

(ii) at least 90% of mature individuals in one subpopulation.

(b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 50 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of 70% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
(a) direct observation
(b) an index of abundance appropriate to the taxon
(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
(d) actual or potential levels of exploitation
(e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
3. A population size reduction of 50%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of 50% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 5000 km², and estimates indicating at least two of a-c:
a. Severely fragmented or known to exist at no more than five locations.
b. Continuing decline, observed, inferred or projected, in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) area, extent and/or quality of habitat
(iv) number of locations or subpopulations
(v) number of mature individuals.
c. Extreme fluctuations in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) number of locations or subpopulations
(iv) number of mature individuals.
2. Area of occupancy estimated to be less than 500 km², and estimates indicating at least two of a-c:
a. Severely fragmented or known to exist at no more than five locations.
b. Continuing decline, observed, inferred or projected, in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) area, extent and/or quality of habitat
(iv) number of locations or subpopulations
(v) number of mature individuals.
c. Extreme fluctuations in any of the following:
(i) extent of occurrence

(ii) area of occupancy
(iii) number of locations or subpopulations
(iv) number of mature individuals.

C. Population size estimated to number fewer than 2500 mature individuals and either:

1. An estimated continuing decline of at least 20% within five years or two generations, whichever is longer, (up to a maximum of 100 years in the future) OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):

(a) Population structure in the form of one of the following:

(i) no subpopulation estimated to contain more than 250 mature individuals, OR

(ii) at least 95% of mature individuals in one subpopulation.

(b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 250 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are: clearly reversible AND understood AND ceased, based on (and specifying) any of the following:

(a) direct observation

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of 30% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of 30%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of 30% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 20,000 km², and estimates indicating at least two of a-c:

a. Severely fragmented or known to exist at no more than 10 locations.

b. Continuing decline, observed, inferred or projected, in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) area, extent and/or quality of habitat

(iv) number of locations or subpopulations

(v) number of mature individuals.

c. Extreme fluctuations in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) number of locations or subpopulations
(iv) number of mature individuals.
2. Area of occupancy estimated to be less than 2000 km², and estimates indicating at least two of a-c:
a. Severely fragmented or known to exist at no more than 10 locations.
b. Continuing decline, observed, inferred or projected, in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) area, extent and/or quality of habitat
(iv) number of locations or subpopulations
(v) number of mature individuals.
c. Extreme fluctuations in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) number of locations or subpopulations
(iv) number of mature individuals.
C. Population size estimated to number fewer than 10,000 mature individuals and either:
1. An estimated continuing decline of at least 10% within 10 years or three generations, whichever is longer, (up to a maximum of 100 years in the future) OR
2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
(a) Population structure in the form of one of the following:
(i) no subpopulation estimated to contain more than 1000 mature individuals, OR
(ii) all mature individuals are in one subpopulation.
(b) Extreme fluctuations in number of mature individuals.
D. Population very small or restricted in the form of either of the following:
1. Population size estimated to number fewer than 1000 mature individuals.
2. Population with a very restricted area of occupancy (typically less than 20 km²) or number of locations (typically five or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and is thus capable of becoming Critically Endangered or even Extinct in a very short time period.
E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.

(Reproduced from the 2001 IUCN Red List of Threatened Animals, www.redlist.org)

VERTEBRATE PEST COMMITEE

Category 1 - Prohibited Pest Animals
Declared Prohibited Pest Animals are those that:
- did not occur naturally in the wild in Australia before European settlement; and
- either-
- are a serious threat to primary production, Crown land, the environment or community health in a place outside Victoria; or
- for which the potential to threaten primary production, Crown land, the environment or community health in Victoria is unknown; and
- the importation, keeping and sale of those animals should be banned.

Category 2 - Controlled Pest Animals
Declared Controlled pest animals are those that:

- did not occur naturally in the wild in Australia before European settlement; and
- have a high potential to become a serious threat to primary production, Crown land, the environment or community health in Victoria; and
- should only be kept in high security collections approved by the Minister.

The Department of Natural Resources and Environment has deemed that the relevant collections will only be statutory zoos (Melbourne and its annexes at Werribee and Healesville), those recognised by the Vertebrate Pests Committee as having "Approved Collections Status" and those approved by the Minister. These can include research and education institutions.

Category 3 - Regulated Pest Animals

Declared Regulated Pest Animals are those that:
- did not occur naturally in the wild in Australia before European settlement; and
- are, or have the potential to become, a serious threat to primary production, Crown land, the environment or community health in Victoria; and
- should only be kept in collections or at premises approved by the Minister. The Department of Natural Resources and Environment has divided Regulated Pest Animals into two types:
- Pest animals that may only be kept at statutory zoos, circuses, wildlife parks or "B" class zoos licensed under the Wildlife Act or at approved research and education institutions.
- Pest animals that can be kept privately. The only species are Indian Antelope (Blackbuck), Bali Cattle, American Bison, Water Buffalo and Guanaco.

Category 4 - Established Pest Animals

Declared Established Pest Animals are those that:
- are established in the wild in Victoria; and
- are a serious threat to primary production, Crown Land, the environment or community health in Victoria; and
- should be eradicated or controlled or their spread in the wild should be prevented.
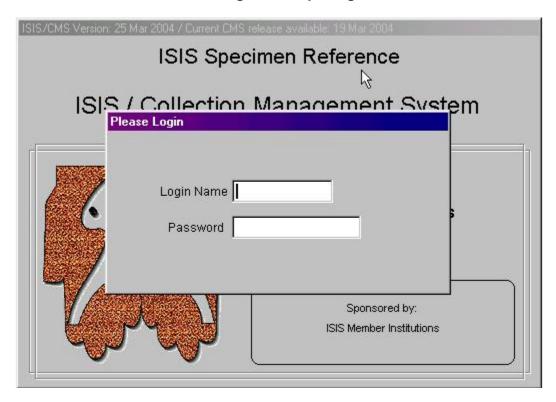
(Reproduced from DSE website – www.dpi.vic.gov.au)

INSTRUCTIONS FOR USING ARKS4

Accessing ARKS4

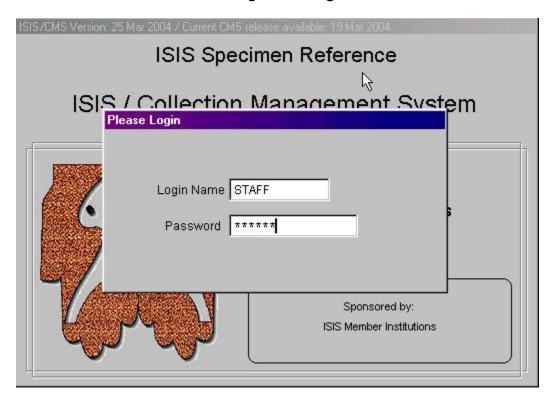To enter ARKS4, simply double click on the ARKS4 icon on your computer's desktop.

You will then find yourself at the login screen of ARKS 4 – Figure 1

Figure 1 – Opening ARKS4

The Records Officer will issue a "read only" password for use by keepers/curators to access ARKS4. Enter this to go to the main menu screen.
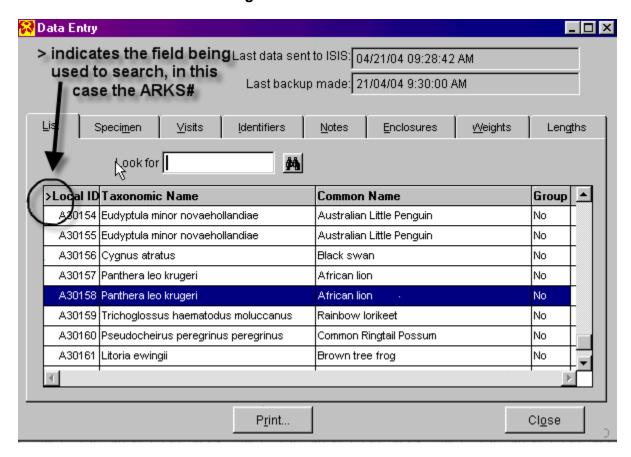
Figure 2 – Login screen

The user name and password will be your current user name and password (or other chosen by you) for accessing the Zoo's network. Please use uppercase letters. Press the enter key. You will enter as a "Guest" which means you will not have editing access, read only. As a Guest, certain options will be available for you to enter, others won't.

Once there, you will need to open the Zoo's database.
1)   Select the File menu, in the top left-hand corner.
2)   Select Open.
3)   You will then see two options – to open the Global dataset from DVD, or your Zoo's database. Select your Zoo.
4)   The program will then run through various steps to open the database (takes ~ 1-2 minutes).

Figure 3 – ARKS4 screen

Once the program has loaded up, a screen similar to the one above should appear. As with any Windows program you can choose to re-size the window using the Reduce/Restore symbols in the upper right hand corner of the Arks window.

Specimens can be accessed either by scrolling down the list using the scroll bar on the right hand side, by entering information in the "Look For:" field, or by using the arrow keys on your keyboard to navigate up or down through the list of displayed specimens.

In the screen above, the "Look For" field is set to search for Local Ids (ARKS#). This is indicated by the **>** symbol next to the words Local Id. Similarly, you can select to search for any of the headings on the list eg Taxonomic Name, Common Name or Group.

To select one of the other headings, simply click on it with your mouse and the **>** symbol will indicate that is the heading used for searching. An example follows using the common name as the search tool.

An example of a search done using Common Name as the search subject. Notice the **>** symbol next to Common Name, indicating this is the field being used to search.
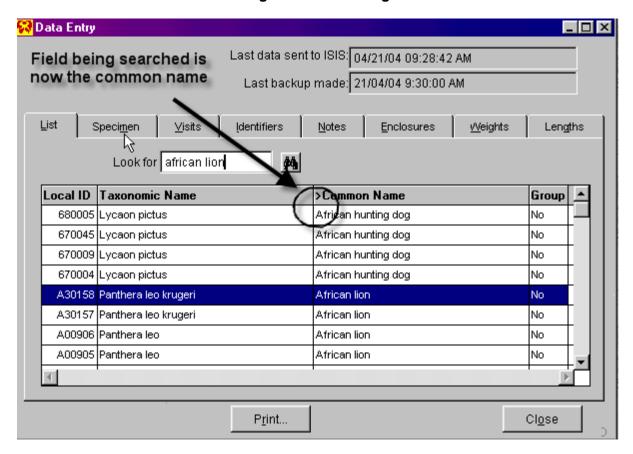
Figure 4 – Searching

This search facility can be used in all screens where the "Look for:" field appears. In some instances the search facility has a pair of binoculars beside it, this indicates that you will be taken to a list were you can select what you are searching for.
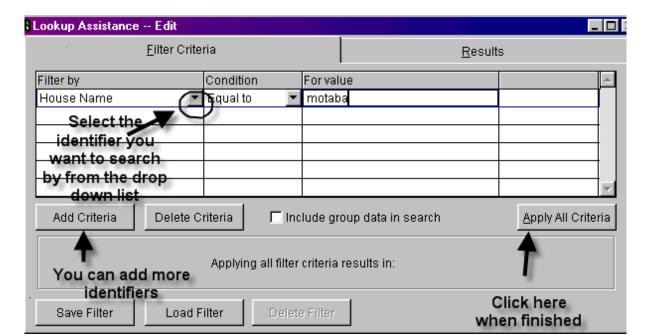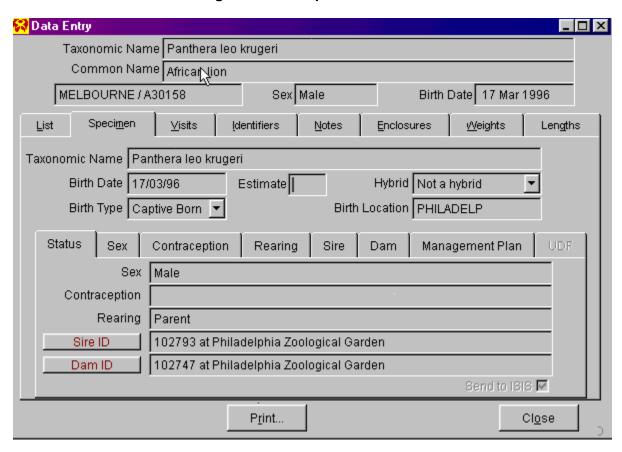
Figure 5 – Look up Assistance

The data for the specimen highlighted (see figure 5) is accessible using the tabs visible behind the List tab. These tabs include Specimen, Visits, Identifiers, Notes, Enclosures, Weights and Lengths.

To access each tab merely click on the tab using your mouse or cycle through using the F9 key to cycle forwards or SHIFT+F9 to cycle backwards.
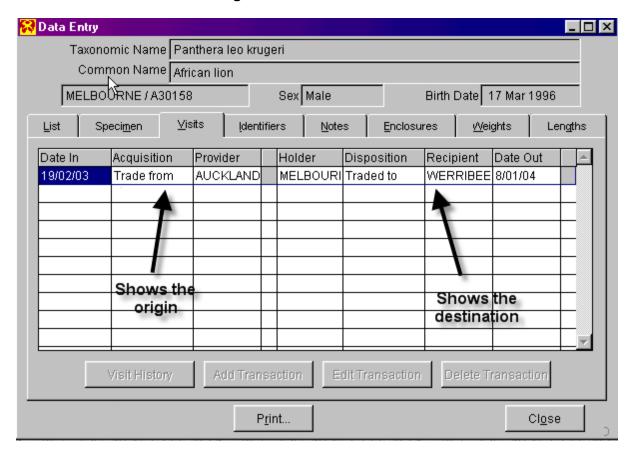
Examples of each tab are provided next.
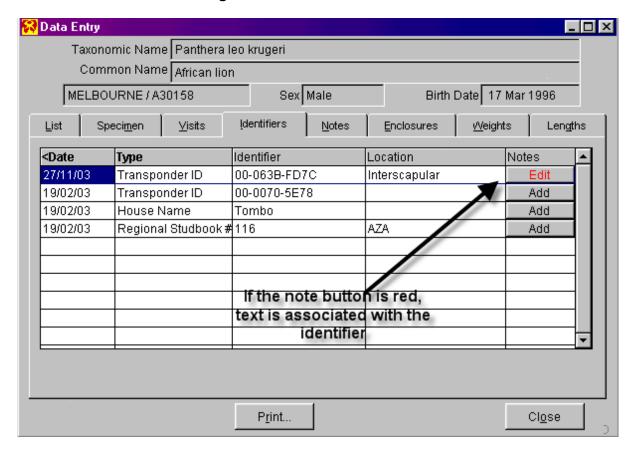
Figure 6 – The Specimen screen

This is a sample of the specimen tab. It shows the basic information regarding the specimen selected eg birth date, birth location, hybrid, birth type etc.

Figure 7 – The Visits screen

This is a sample of the Visits tab. Visits are transactions. It should show when a specimen came into our collection, acquisition type, from whom and any other transactions that may have taken place since it's acquisition by Melbourne Zoo.
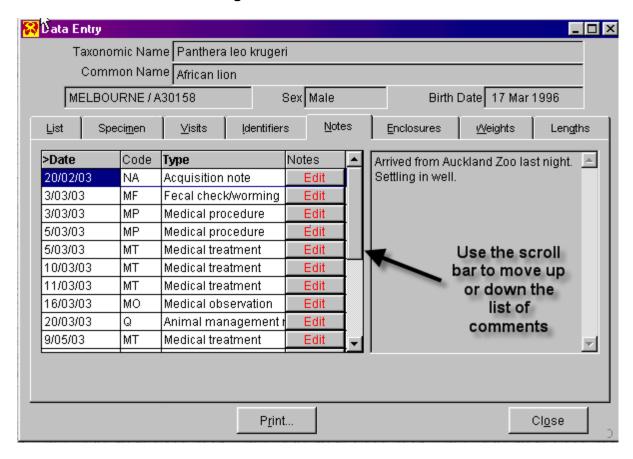
Figure 8 – The Identifiers screen

Identifiers show any form of Id associated with the specimen accumulated since its arrival at Melbourne Zoo.

With this tab and subsequent tabs, text can be added by the Animal Records Officer associated with the Identifier. If the Note button is RED, text is associated with the identifier and may be viewed by clicking on the button.
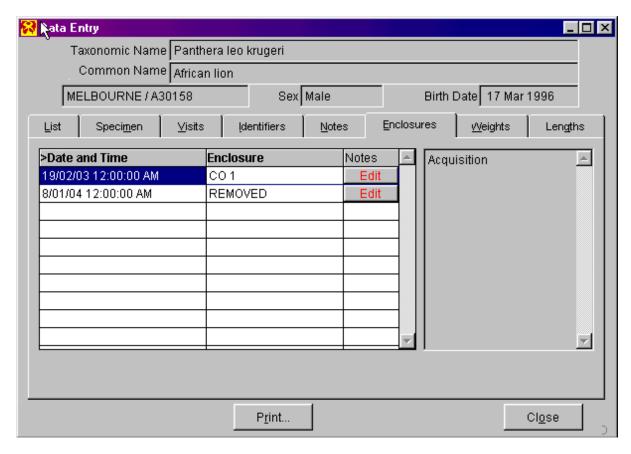
Figure 9 – The Notes screen

>Date	Code	Type	Notes
20/02/03	NA	Acquisition note	Edit
3/03/03	MF	Fecal check/worming	Edit
3/03/03	MP	Medical procedure	Edit
5/03/03	MP	Medical procedure	Edit
5/03/03	MT	Medical treatment	Edit
10/03/03	MT	Medical treatment	Edit
11/03/03	MT	Medical treatment	Edit
16/03/03	MO	Medical observation	Edit
20/03/03	Q	Animal management r	Edit
9/05/03	MT	Medical treatment	Edit

Arrived from Auckland Zoo last night. Settling in well.

Use the scroll bar to move up or down the list of comments

The notes tab shows data entered for the selected specimen. A preview screen on the right shows the comments added against the dated code. Once again this can be selected for view only by clicking the RED edit button.
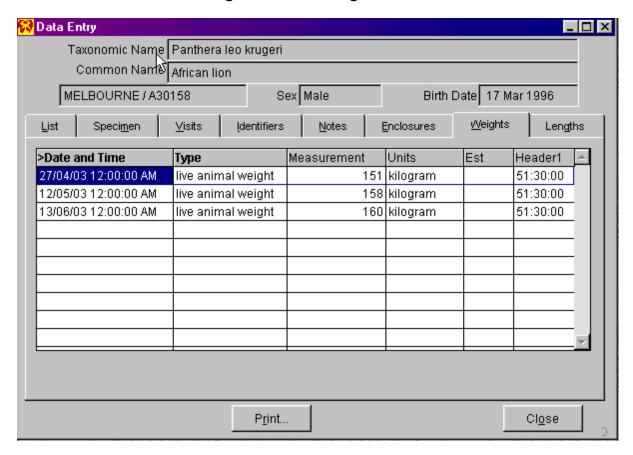
A scroll bar located in the middle of the screen allows you to scroll down the list of comments, or simply use the up/down arrow keys to move in the desired direction.

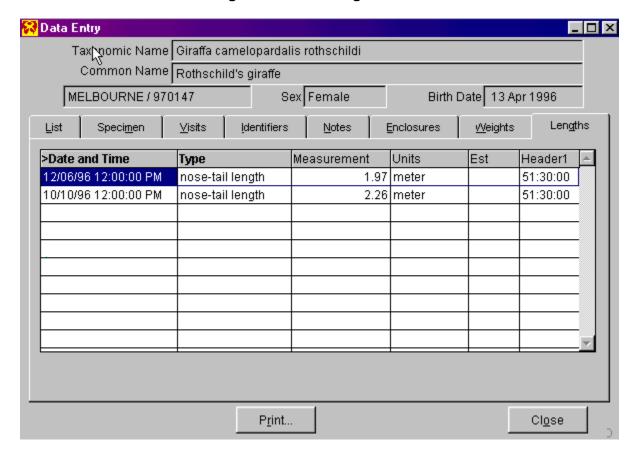**Figure 10 – The Enclosure screen**

The Enclosure screen shows enclosures that the specimen has been in since its arrival at Melbourne Zoo. This screen is similar to the Notes tab as it provides the same scroll functions as well as a brief description in a preview screen of the enclosure or reason for move.

Figure 11 – The Weight screen

>Date and Time	Type	Measurement	Units	Est	Header1
27/04/03 12:00:00 AM	live animal weight	151	kilogram		51:30:00
12/05/03 12:00:00 AM	live animal weight	158	kilogram		51:30:00
13/06/03 12:00:00 AM	live animal weight	160	kilogram		51:30:00

The Weights screen shows weight collected for the selected specimen. Once again there is the ability for text to be added by the Animal Records Officer associated with the collection of weights.

Figure 12 – The Length screen

The Lengths screen is similar to previous screens.

Each specimen has a series of "sub" tabs that provide information regarding several management issues that are specific to that specimen. These include Sex, Contraception, Rearing, Sire, Dam, and Management Plan. Once again these are read only tabs. They can be accessed in a similar fashion to the higher tabs, and all have the facility to add notes concerning each entry made.
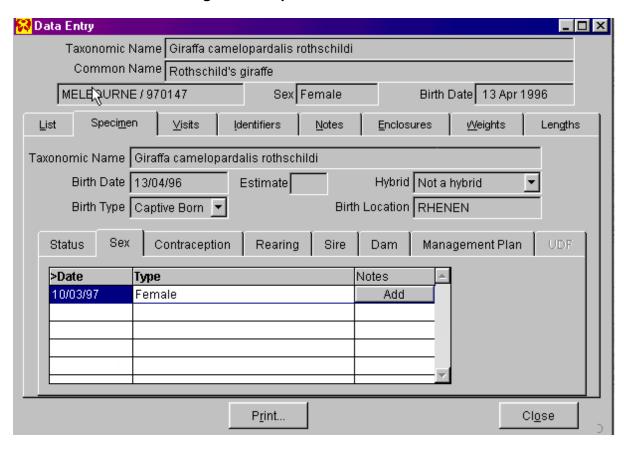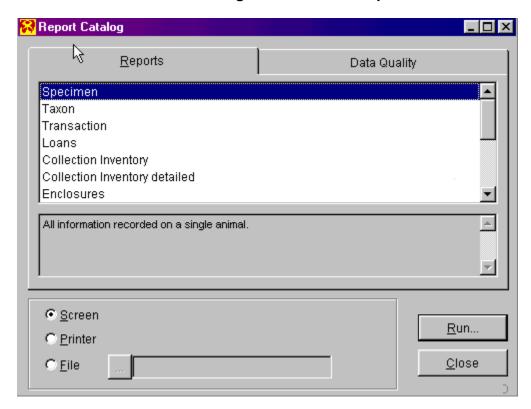
Figure 13 – Specimen "Sub" screen
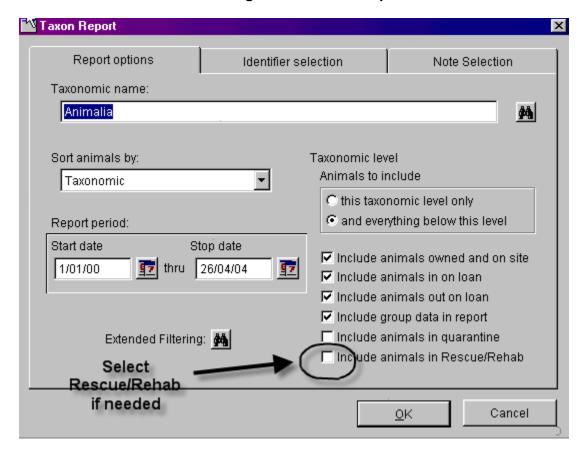
Figure 14 – ARKS4 Reports

This screen shows some of the reports available using Arks4. Reports can be accessed by clicking on "Reports" at the top of your Arks window. When you do this a smaller screen similar to above should pop up imposed over the top of the normal Arks window. This screen can also be re-sized accordingly.

A scroll bar is located on the right of this smaller screen, allowing you to scroll down the list to select the appropriate report. You can also navigate up and down using your arrow keys on your keyboard. A brief description of each report is included in the preview window below the list.

A description of a how to obtain a taxon report follows.

Figure 15 – Taxon Report

To select a Taxon report, highlight "Taxon" and click on the RUN button on the lower right hand side. You can select to send the report to Screen, Printer or File. Screen is probably the best place to start off initially until familiar with the program.

When you click the RUN button the above screen should appear. This screen allows you to choose the type of information you wish to include in the report.

The most important part at this stage is to select the name of the species you are running the report for. Above you can see a pair of binoculars beside the "Taxonomic name" field, this allows you to browse a list of either taxonomic name, taxonomic monomials or common names etc. As with the main Arks screen, you can select the type of search by clicking on

the appropriate column and highlighting it with the **>** symbol. An example follows.
Once you have selected the appropriate species, you must select the correct date range, how you wish the report to be sorted eg taxonomically, by accession numbers or birthdates.

You will also notice some tabs behind the Report Options screen that will allow you to choose what type of Identifiers you wish to include and any types of Notes you want as well. Click on these tabs to browse the selection available. To select an option you must highlight it and click the "Add To" button or "Select All" button.

Once you have designed the report you want, click the OK button and the report should start to be compiled. Depending on the amount of information requested and the date range, the report may take a few moments. At this stage this is one of the weaknesses of Arks4, some reports take along time to be generated.

You should also be aware of the fact that the Taxon report will not produce a tally at the end the report like Arks3 did. This report will show you each specimen held in the collection during the date range, but will not add them up for you. To get this figure, you must run a "Collections Inventory" or "Collections Inventory – detailed" report.

Once the taxon report is completed, it will appear on the screen in a reduced format. To view the report you will have to re-size it using the appropriate symbols. Once it is on screen, you can also select to print the report. To do this click on the printer icon visible on the "Print Preview" bar on the top left hand corner. This will run the report to your local printer.

This is a brief overview of how to obtain a Taxon Report. There are many other reports available on Arks4, each one is different. However the basic principals outlined above should apply. Feel free to experiment with all the reports until you become familiar with them.

You can choose print, which will not show the report on the screen, but will take you to the normal windows print option box. You can print to the normal windows default printer. However, if you want to save the file, please select the Fine Print option as your printer. This will save the file as a "pdf" file. Note: Fine Print is currently unavailable on Windows XP computers in Melbourne.

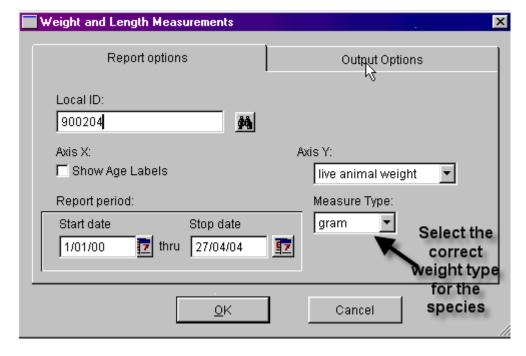An example is shown below of a Weight & Length graph, which is a new feature of ARKS4.

Figure 16 – Weight Graph

Select the weight and length measurement report option and the screen shown above will appear. You will need to enter the ARKS# (Local ID) – again there are binoculars to help you find the animal you are looking for if you don't know their ARKS#. Make sure you choose an appropriate date range, the weight or length you would like to graph, and the measure type. Click on the OK button when you are ready.

Measurements Report for Melbourne Zoo / 900204

Taxonom name: *Gorilla gorilla gorilla*   Family: Hominidae
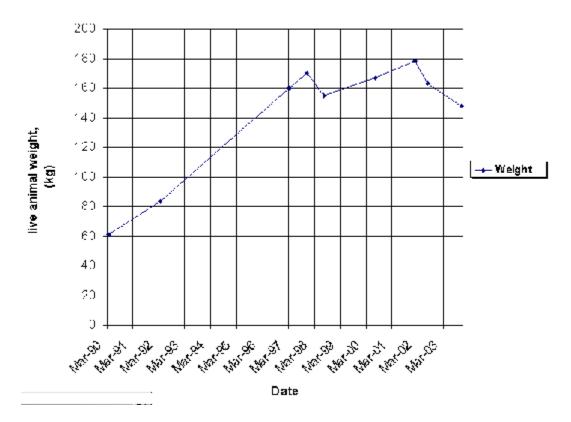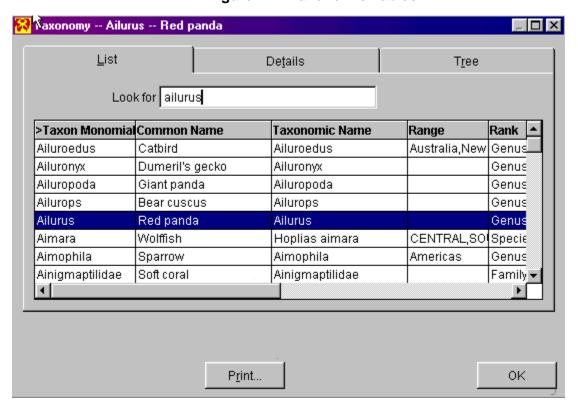Common name: Western Lowland Gorilla   Order: Primates

Figure 17 – Taxonomic Tables

An example of the Taxonomic list available on Arks4 is shown above. You can select a name using the list by entering the appropriate information in the "Look For" field, in this case the Taxonomic Monomial column is the column used for the search.

If you are unsure of species names, but have a Genus name, you can enter the Genus name and then go to the Tree tab and you will be able to access a range of species options for that Genus name. You will have to click on the + symbol on the list to access information regarding the Genus and its lower levels. A sample of how this is presented is shown below.
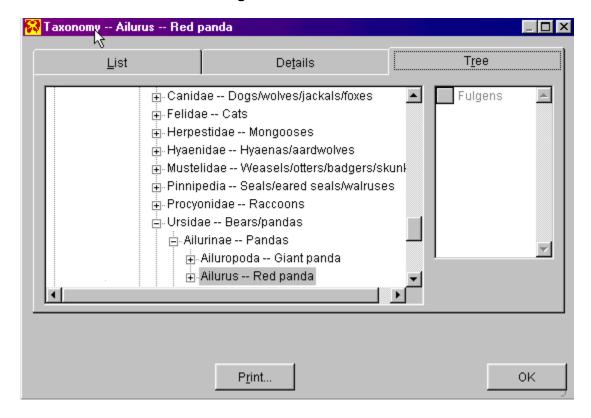
Figure 18 – Taxonomic Tree

When you are ready to exit ARKS4, please make sure you click on the Close button of each screen. When all are closed, select the File menu from the top left corner, and select exit from the drop down menu.

STUDBOOKS AND STUDBOOK KEEPERS – What is it all about?

The ASMP offices in Sydney appoint regional Studbook Keepers. There are currently two ways of obtaining a studbook. Firstly an established studbook becomes available due to a studbook keeper leaving a zoo, or simply not performing the 'duties' required of the studbook position. Secondly TAG convenors make recommendations that a studbook should be held for a particular species and studbook becomes 'available', this is usually advertised in the ARAZPA news (this is now circulated to ARAZPA members, and is available in the Melbourne Zoo library).

Application to become a studbook keeper must be approved by your supervisor and made to the ASMP office in Sydney. One of the issues that seems to have been causing the most confusion over the past few years is what being a studbook keeper entails. The following pages explain the roles of a studbook keeper relevant to the category the species of animal has in the ASMP.

The ASMP category list and what it means is listed in this manual. If this were your first studbook, it would probably be recommended that you take on a Category 3 species, that is, more as a developmental opportunity for you to learn about creating a studbook and a SPARKS dataset, as the species in Category 3 are classified as low level regional management with species monitored by the Taxon Advisory Groups. Thus you would be expected to produce and update a SPARKS studbook which would still be registered and recorded to the ASMP, but you would not be expected to make recommendations on pairings, or captive management of this species in the region.

At the opposite end of the categories classifications, is a category 1 studbook keeper, who is also usually (but not always) the species coordinator for their studbook species in the region. A category 1 studbook keeper is usually managing a threatened native species whose captive population is managed as part of a wildlife agency species recovery program. In this case, the category 1 studbook keeper would be expected to analyse the SPARKS studbook dataset, know how to interpret the data generated by DEMOG and GENES (programs embedded in SPARKS) to make pairing recommendations to the zoos holding the species, coordinate the captive management of the species in the region and select animals for release to the wild programs. An example at Melbourne Zoo is the Eastern Barred Bandicoot studbook. Generally species coordinators have attended one of the ASMP training workshops which have been run over the past few years. These courses have trained a lot of people regionally to learn interpretation and analysis of data in studbooks. Generally someone commencing their first studbook would not be given a Category 1 or 2 species to manage.

For basic training in updating what is know as a 'raw' dataset for a new studbook keeper, staff would approach the Records Officer who has been trained by the ASMP. This position in every ARAZPA zoo in the region is also responsible for endorsing studbook data for every species that has a studbook in the region and is held in their institution. That is a studbook keeper will send a copy of the list of specimens held at Melbourne Zoo to the Records Officer, who then has to check their data against both the current ARKS holdings and historical records and endorse the accuracy of the data, before returning it to the studbook keeper at the other institution. This procedure has now been accepted as standard by the AGRO (Australasian Group of Records Officers).

When a studbook keeper is happy with the accuracy of their dataset, it is submitted to the ASMP offices, where the Population Biologist does a final check over the data before the studbook is endorsed. Studbooks are updated twice yearly and once endorsed by the

ASMP, are sent to ISIS in the USA; they are then copied onto a DVD, which is sent back to the Records Officers.

ASMP POSITION DESCRIPTIONS

ASMP programs begin with a decision by the relevant Taxon Advisory Group (TAG) that a particular taxon would benefit from some level of regional coordination and/or resourcing. The TAG determines whether the taxon requires a conservation program, a population management program or a husbandry program.

Species Contacts
Position holders are initially appointed to the position of Species Contact, while they develop the framework of a species program – the Program Outline. This details the rationale behind the selection of the species for regional attention and provides a work plan tailored to achieve the program's objectives. The work plan might include some or all of the following program components: a studbook, a captive management plan, husbandry guidelines, a regional plan for cooperative acquisition, a review of conservation measures, a plan for a regional education program and so on. Once the Species Contact has completed an approved Program Outline and has begun to implement the work plan, their position is upgraded to one of those listed below.

Husbandry Program Coordinators
Husbandry Program Coordinators develop husbandry and management resources for the target taxon. For some taxa this involves reviewing and documenting techniques that reflect regional standard practice. For others, where little is known, the work involves initial investigation and may require coordinating or monitoring trials.

Studbook Keepers
Studbook Keepers are responsible for maintaining studbook data and periodically reporting to the TAG. Some studbook keepers will be required to develop and implement a management strategy for the taxon involved. Once the strategy has been approved by the relevant advisory group and by staff at the ARAZPA office, studbook keepers are upgraded to the position of species coordinator.

Species Coordinators
Species Coordinator responsibilities include: maintaining a studbook, analysing the population annually, providing specimen recommendations to institutions on the basis of these analyses, reporting regularly to the ARAZPA office and coordinating any other areas of regional work required for the taxon (as directed by the relevant advisory group).

Taxon Advisory Group (TAG) Convenors
TAG Convenors are responsible for coordinating the production of recommendations for defined groups of species, usually an Order or Family. TAG Convenors also monitor and direct the activities of voluntary position holders for taxa covered by the TAG.

TAG Advisors
Each TAG has a number of advisors who provide specialised expertise as needed. Advisors may be drawn from within member zoos, or from the wider conservation or scientific community. Typically, TAGs have advisors for veterinary issues, education, taxonomy and husbandry.

(Reproduced from ASMP Regional Census and Plan, 2006).

APPENDIX I

CURRENT INTERNATIONAL METHODS USED IN ANIMAL IDENTIFICATION

Probably the most critical factor forming the basis of animal records is the individual identification of each specimen.

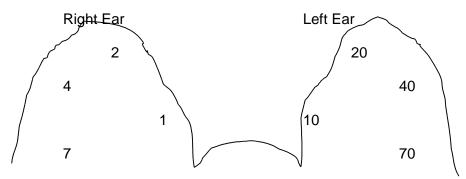The adopted standards are:

EAR TAGS, LEG BANDS, WING TAGS

Males on the RIGHT, Females on the LEFT, Unsexed on the RIGHT.
Example of ARKS format for entry of data: 54 Blue, Location: RL.

TATTOOS

Males on RIGHT Ear or Inner Thigh, Females on the LEFT.
Example of ARKS format for entry of data: M(L) 88(R), Location: RE

EAR HOLES

Used to designate number only, not sex of animal. Any number may be depicted by hole punching/notching a combinations of the locations below.

Right Ear   Left Ear

2   20

4   40

1   10

7   70

MICROCHIPS/TRANSPONDERS

The Trovan Transponder system is the accepted standard for the zoo industry. In Australia, equipment and chips are available from Central Animal Registry, 570 Springvale Rd, Springvale South, VIC 3172. Tel: 03 9546 3627, Fax: 03 9548 4471.
Example of ARKS format for data entry: 00-0000-0000, Location: interscapular.

The implant sites below were recommended by the Captive Breeding Specialist Group:

Fish	Large (>30cm)	Left base of dorsal fin
	Small (<30cm)	Coelomic cavity
Amphibia	Lymphatic, cover wound with skin bond	
Reptiles	Chelonians	Left hind limb socket
	Crocodilians	Anterior to Nuchal cluster
	Lizards	(large, >12.5cm) Left inguinal region
		(small, <12.5cm) Intercoelomic cavity
	Snakes	Left nape of neck

Birds	Large (>1.5kg)	Dorsally at juncture of neck and body
	Small (<1.5kg)	On Pectoral muscle.
	Psittaciformes	Left Pectoral muscle
	Vultures	Both Old and New World – Base of neck
	Falconiformes	Pectoral muscle
Mammals	Large (>17cm)	Behind left ear at base
	Small (<17cm)	Between shoulder blades, left of centre.
	Elephants	Main caudal fold parallel to tail on left side
	Hyrax	Intralumbar, left of centre (thick skin on neck makes implantation difficult)
	Loris	Intralumbar, left of centre (dermal shield makes scapular implantation difficult)

APPENDIX II

GLOSSARY OF TERMS & ACRONYMS

AFA	Avicultural Federation of Australia
AGRO	Australasian Group of Records Officers
ANZECC	Australian and New Zealand Environment and Conservation Council
AQIS	Australian Quarantine and Inspection Service
ARAZPA	Australasian Regional Association of Zoological Parks and Aquaria
ARKS	Animal Records Keeping System
ASMP	Australasian Species Management Program
ASZK	Australasian Society of Zoo Keeping
AZA	American Zoo and Aquarium Association
CALM	Conservation and Land Management, WA
CAPACITY	Species Management Analysis software
CBSG	Conservation Breeding Specialist Group of the IUCN's Species Survival Commission
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMAG	Captive Management Advisory Group, NZ
CMP	Captive Management Plan
CSIRO	Commonwealth Scientific Investigation & Research Organisation
DEHAA	Department of Environment, Heritage and Aboriginal Affairs, SA
DEMOG	Demographic Analysis software
DNRE	Department of Natural Resources and Environment, VIC
DOC	Department of Conservation, NZ
EA	Environment Australia
EEP	European Endangered Species Programs
ESP	Endangered Species Protection Act, Australia
GCAP	Global Captive Action Plan
GCAR	Global Captive Action Recommendations
GENES	Genetic Analysis software
ISIS	International Species Information System
IUCN/SSC	Species Survival Commission of the World Conservation Union (previously International Union for the Conservation of Nature)
IUDZG	International Union for the Directors of Zoological Gardens
MAF	Ministry of Agriculture and Fisheries, NZ
MedARKS	Medical Animal Records Keeping System
NSW NPWS	NSW National Parks and Wildlife Service
PHVA	Population Habitat Viability Assessment
PVA	Population Viability Assessment
PWCNT	Parks and Wildlife Commission of the Northern Territory
QDOE	QLD Department of Environment
RAOU	Royal Australian Ornithological Union (now Birds Australia)
REGASP	Regional Animal Species Collection Plan
SPARKS	Single Population Animal Records Keeping System
SSP	Species Survival Plan of the AZA
TAG	Taxon Advisory Group
VPC	Vertebrate Pest Committee, Australia

APPENDIX III

ZOOLOGICAL PARKS & GARDENS BOARD VALUES & PURPOSE STATEMENTS

Our Vision

We build enduring relationships between people and wildlife for a future in which humans live in balance with the natural world.

Our Purpose

To lead, inspire and empower everyone to connect with wildlife, build knowledge, develop skills and take informed action to conserve the natural world.

APPENDIX IV

WORLD ZOO CONSERVATION STRATEGY - EXECUTIVE SUMMARY – 1993

A new strategy is in place, which was launched at the joint ARAZPA/SEAZA conference in Melbourne, in May 2005. However, this summary remains relevant. A copy of the World Zoo and Aquarium Conservation Strategy is held in the Conservation Office.

APPENDIX V

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