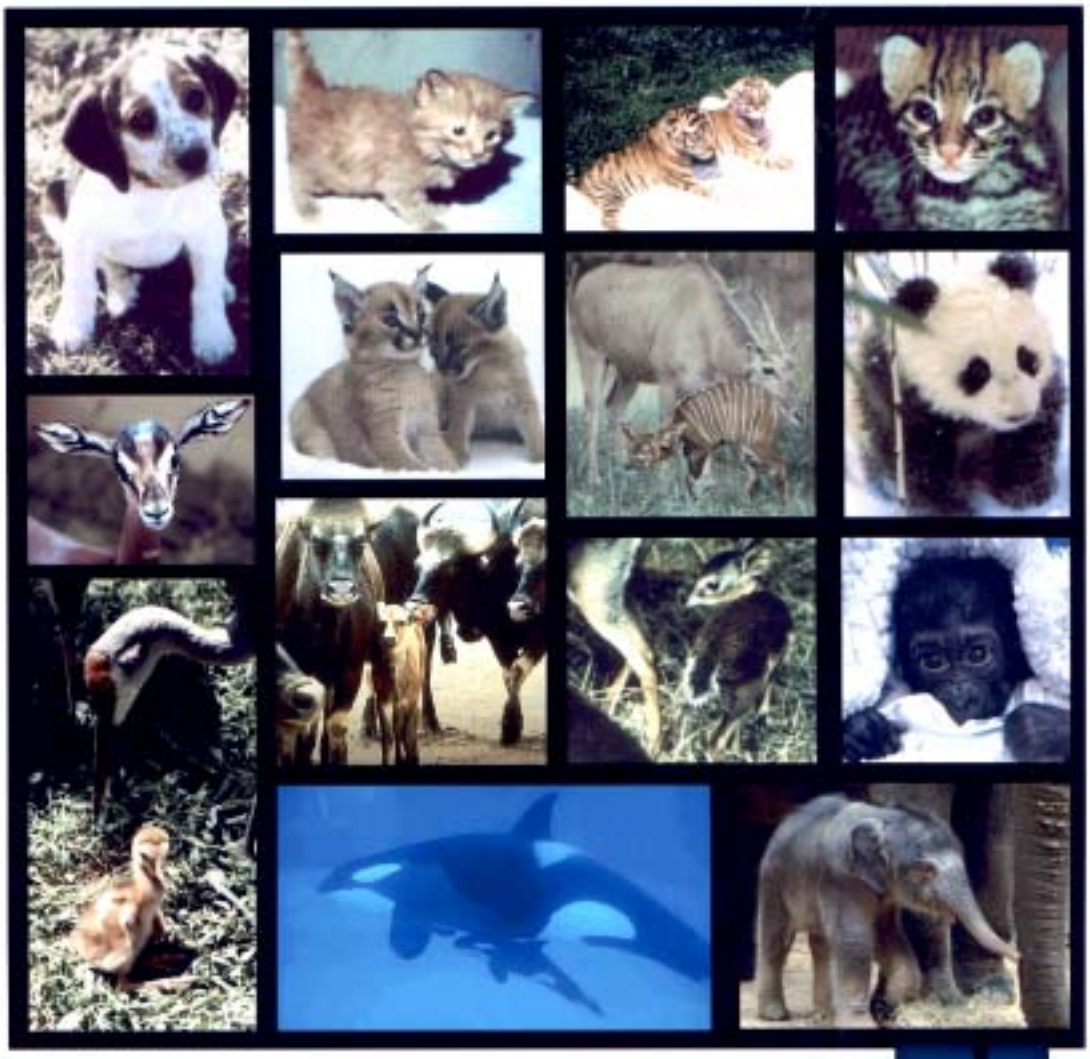
The IETS Parent Committee on Companion Animals, Non-Domestic & Endangered Species (CANDES)



Report and minutes from the inaugural meeting held on Sunday, 13 January 2002, 08:00-11:00 at the Hotel Bourbon, Foz do Iguaçu, Parana, Brazil in association with the 28th Annual Conference of the International Embryo Transfer Society

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COVER PHOTOGRAPH CREDITS AND RELEVANT LITERATURE

First domestic puppy produced by embryo transfer.

Kraemer DC, Flow BL, Schriver MD, Kinney GM and Pennycook JW (1979). Embryo transfer in the nonhuman primate, feline and canine. Theriogenology 11: 51-62.

Kinney GM, Pennycook JW, Schriver MD, Templeton JW and Kraemer, DC (1979). Surgical collection and transfer of canine embryos. Biol Reprod Suppl 20:96.

First domestic kitten produced by the transfer of a frozen/thawed embryo.

Dresser BL, Gelwicks EJ, Wachs KB and Keller GL (1989). Cryopreservation and transfer of embryos of the domestic cat (Felis catus). J Reprod Fertil Suppl 39:332.

Bengal tiger cubs produced by the transfer of IVF-derived embryos.

Donoghue AM, Johnston LA, Seal US, Armstrong DL, Tilson RL, Wolf P, Petrini K, Simmons LG, Gross T and Wildt, DE (1990). In vitro fertilization and embryo development in vitro and in vivo in the tiger (Panthera tigris). Biol Reprod 43:733-744.

Ocelot kitten produced by the transfer of a frozen/thawed, IVF-derived embryo.

Swanson WF (2001). Reproductive biotechnology and conservation of the forgotten felids – the small cats. Proceedings of the 1st International Symposium on Assisted Reproductive Technology for the Conservation & Genetic Management of Wildlife (ARTSymposia@omahazoo.com), pp. 99-120.

Mohrr gazelle calf (Cincinnati Zoo photo: http://cincinnati.com/postcard/zoo.html).

Pickard AR, Abaigar T, Green DI, Holt WV and Cano M (2000). Estrogen excretion as a prediction of fertility in an exotic ungulate, the Mohor gazelle (Gazella dama mhorr). Theriogenology 53:343.

Pickard AR, Abaigar T, Green DI, Cano M and Holt WV (2001). Hormonal and behavioral predictors of breeding success in the Mohor gazelle (Gazella dama mhorr). Theriogenology 55:396.

Pope, CE (2001) Antelope reproductive biology & ART. Proceedings of the 1st International Symposium on Assisted Reproductive Technology for the Conservation & Genetic Management of Wildlife (ARTSymposia@omahazoo.com), pp. 45-50.

Caracal cubs produced by the transfer of IVF-derived embryos.

Pope CE, Gomez MC, Davis AM, Harris FR, Mikota SK, Boyd EH and Dresser BL (2001). Oocyte retrieval, in vitro fertilization and embryo transfer in the caracal (Caracal caracal). Theriogenology 55:397.

Bongo calf produced by interspecies embryo transfer to an eland.

Dresser BL, Pope CE, Kramer L, Kuehn G, Dahlhausen RD, Maruska EJ, Reece B and Thomas WD (1984). Successful transcontinental and interspecies embryo transfer from bongo antelope (Tragelaphus euryceros) at the Los Angeles Zoo to eland (Taurotragus oryx) and bongo at the Cincinnati Zoo. Proceedings of the American Association of Zoological Parks & Aquariums, pp. 166-168.

Giant panda cub (photo by Keren Su; www.healthyplanet.com).

Lindburg, D (2000) Splendid beauty arrives in San Diego. American Zoo and Aquarium Association Communiqué (February issue), pp. 7-8.

For additional references, see: http://pandas.si.edu/research/biblio.htm

Sandhill crane chick produced by artificial insemination (Henry Doorly Zoo photo: *http://www.omahazoo.com*).

LaRue C and Swengel S (1980). Increasing fertility of crane eggs. Avicultural Magazine 86:10-15.

Donoghue AM, Blanco JM, Gee G and Wildt, DE (2001). Cryopreservation of Avian spermatozoa: new approaches to aid in the conservation of birds. Proceedings of the 1st International Symposium on Assisted Reproductive Technology for the Conservation & Genetic Management of Wildlife (ARTSymposia@omahazoo.com), 193-196.

Gaur calves produced by artificial insemination and embryo transfer (Henry Doorly Zoo photo: *http://www.omahazoo.com*).

Solti L., Crichton EG, Loskutoff NM and Cseh S (2000). Economical and ecological importance of indigenous livestock and the application of assisted reproduction to their preservation. Theriogenology 53:149-162.

Pope CE and Loskutoff NM (1999). Embryo transfer and semen technology from cattle applied to nondomestic artiodactylids. In: Zoo and Wild Animal Medicine: Current Therapy, 4th Edition. M.E. Fowler and R.E. Miller (Eds.), W.B. Saunders Co., Philadelpia, pp. 597-604.

Suni calf produced by embryo transfer.

Loskutoff NM, Raphael BL, Nemic LA, Wolfe BA, Howard JG and Kraemer DC (1990). Reproductive anatomy, manipulation of ovarian activity and nonsurgical embryo recovery in suni (Neotragus moschatus zuluensis). J Reprod Fertil 88:521-532.

Gorilla offspring produced by the transfer of an IVF-derived embryo.

Pope CE, Dresser BL, Chin NW, Liu JH, Loskutoff NM, Behnke EJ, Brown C, McRae MA, Sinoway CE, Campbell MK, Cameron KN, Owens OM, Johnson CA, Evans RR and Cedars MI (1997). Birth of a western lowland gorilla (Gorilla gorilla gorilla) following in vitro fertilization and embryo transfer. Am J Primatol 41:247-260.

Killer whale calf produced by artificial insemination (Sea World photo: *http://www.seaworld.org/ZNN/September2001/kwborn.htm*)

Robeck TR (2001). Cetacean reproductive biology and ART. Proceedings of the 1st International Symposium on Assisted Reproductive Technology for the Conservation & Genetic Management of Wildlife (ARTSymposia@omahazoo.com), pp. 179-188.

Asian elephant calf produced by artificial insemination (photo by: Jessie Cohen, National Zoological Park, Washington, DC, USA: *http://natzoo.si.edu/*).

Brown JL (2001). Elephant endocrinology. Proceedings of the 1st International Symposium on Assisted Reproductive Technology for the Conservation & Genetic Management of Wildlife (ARTSymposia@omahazoo.com), pp. 11-14.

Schmitt DL, Hildebrandt TB, Hermes R and Göritz F (2001). Assisted reproductive technology in elephants. Proceedings of the 1st International Symposium on Assisted Reproductive Technology for the Conservation & Genetic Management of Wildlife (ARTSymposia@omahazoo.com), pp. 15-18.

REPORT TO THE IETS BOARD OF GOVERNORS
January, 2002

The inaugural meeting of the IETS Parent Committee on Companion Animals, Non-Domestic and Endangered Species (CANDES) was held on Sunday, 13 January 2002 at 08:00-11:00 in the Ipê 1 Room in the Hotel Bourbon Convention Centre at Fos do Iguaçu, Parana, Brazil, just before the commencement of the 28th Annual Conference of the IETS. There were approximately 40 people in attendance, and this was lower than expected -- probably due to the fact that the meeting was not announced as "open" (many explained afterwards that they did not know if they could attend; however, the reception/dance the night that ended at 06:30 that morning also was a contributing factor). Nevertheless, many of the people who did attend were willing to serve on the Parent Committee and names were provided for those that were interested in membership, but were not present.

The first order of business was to introduce the CANDES Parent Committee Chairman (Loskutoff), Secretary (Pickard) and Subcommittee Chairmen (see below), then briefly go over the draft copy of the Terms of Reference that was submitted to the IETS Board of Governors for review and approval.

Action items identified for the Parent Committee resulting from this session are listed on pp. 6-7, and are summarized as follows:

- Hold a two-day working meeting in April to further discuss goals and prioritize objectives;
- Revise and complete the final draft of Terms of Reference;
- Discuss the possibility of providing an official statement of ethical practice to be submitted to the IETS Board of Governors;
- Prepare mid-year report for the IETS Board of Governors in time for their mid-year teleconference;
- Hold a one day working meeting in conjunction with the 2nd International Symposium on ART for the Conservation & Genetic Management of Wildlife, to be held in September, 2002;
- Prepare a presentation for the 2003 IETS Annual Conference to report activities of the CANDES Parent Committee to the IETS membership.

The Subcommittee Chairmen then took the floor to explain the goals of their respective Subcommittees and sign-up sheets were distributed to the audience.

Research Subcommittee (Co-Chairmen: Krisher and Swanson):

- A specific and limited list of taxa will be identified to target initial focus upon for developing resource guides consisting of information that would provide the ground work for the application of embryo transfer and related technologies in CANDES;
- The Subcommittee Chairmen and Parent Committee Secretary (Pickard) will communicate with the Chairman of the IETS Website Ad hoc Committee (Fayrer-Hosken) and IETS Executive Secretary (Gavel) to determine the most effective format to make this information available to the IETS membership.

Technology Subcommittee (Co-Chairmen: Damiani and Hildebrandt):

- A list of "alternative" strategies will be prepared that may be used to overcome certain limitations that may be inherent to certain protocols (i.e., methods for culturing embryos without the availability of a CO_2 incubator, etc.);
- The Subcommittee will identify and prioritize areas in need of technological development to permit the application of embryo transfer and related technologies to CANDES;
- The Subcommittee will form associations with companies that include the design and development of novel instrumentation, in order to provide information to the IETS membership on who to contact for specialized items;
- A list of laboratories will be identified that can perform procedures such as urinary or fecal hormone assays that can assist in planning assisted reproduction programs in CANDES.

Health and Safety Subcommittee (Co-Chairmen: Holt and Loskutoff):

- A comprehensive review on pathogen interactions with semen will be prepared which will include summaries of all relevant literature. This document will be reviewed by the Subcommittee; the document and review will be submitted to the HASAC Research Subcommittee in time for the 2003 IETS Annual Conference.

Regulatory Subcommittee (Co-Chairmen: Crichton and O'Brien):

- A goal of this committee will be to clarify, on a country-by-country basis, what is required to obtain the necessary permits for legally transporting animal gametes, embryos, tissues and excretory products;
- The Subcommittee will also explore the possibility of creating a common format that would address all of the possible concerns when filing for permits (from a governmental regulatory standpoint as well as for CITES), and making this information available on the IETS website;
- A list will be compiled that will specify which biological materials are not regulated and, therefore, do not require specific permits for transport;
- The Subcommittee will investigate methods available, or that are in need of development, for properly sealing and labeling some of the newer packaging devices used for vitrifying embryos (e.g., open pulled straws). This information will be submitted to the Chairmen of the HASAC Forms and Certificates Subcommittee (Robertson) and Regulatory Subcommittee (Delver).

The mid-year working meeting for the IETS CANDES Parent Committee will be held on 27-28 April 2002 at the Henry Doorly Zoo in Omaha, Nebraska and it will overlap with a two-day working meeting of the American Zoo and Aquarium Association (AZA) Reproduction Advisory Group meeting (Co-Chairmen: Loskutoff and Goodrowe). The report from this meeting will be distributed by mid-May, 2002 to: 1) the IETS Board of Governors and Executive Secretary; 2) the IETS CANDES Parent Committee members; and 3) the IETS HASAC Parent Committee Chairman (Thibier) and Subcommittee Chairmen (Stringfellow, Delver, Howard and Robertson).

Respectfully Submitted,
Naida M. Loskutoff, PhD
Chairman, IETS CANDES Parent Committee

Report of the Inaugural Meeting of the IETS Parent Committee on Companion Animals, Non-Domestic & Endangered Species (CANDES)
Sunday, 13 January 2002, 08:00-11:00,
Hotel Bourbon Convention Centre, Room Ipê 1, Foz do Iguaçu, Brazil

I. In Attendance

Parent Committee Present
Elizabeth G. Crichton, PhD
Rebecca Krisher, PhD
Naida M. Loskutoff, PhD
William F. Swanson, DVM, PhD

Parent Committee Regrets
Philip Damiani, PhD
Thomas Hildebrandt, DVM, PhD
William V. Holt, PhD
Justine O'Brien, PhD
Amanda Pickard, PhD

IETS Annual Conference Delegates Present

Mercedes Alvarez
Luis Anel
Paul Bartels
Enrico Casadei
Jackie Coulon
Berenice de Avila Rodrigues
András Dinnyés
Wenche Farstad
Adele Faul
Richard Fayrer-Hosken
Robert A. Godke
Martha Gomez
Rebecca Harris
Brad Lindsey
R. Luzbel Jebsotn
Gaia Cecilia Luvoni
Reuben Mapletoft
Gabriela Mastromonaco
Ronaldo Morato
Nei Moreira
Karine Onclin
Katharine M. Pelican
Earle Pope
Cristina Rodriguez
Terri Roth
Laszlo Solti
Rebecca Spindler
John Verstegen

IETS Member Regrets

Barry Bavister
Charles Bormann
Eliza Curnow
John Diehl
Barbara Durrant
Klaus Eulenberger
Diego Ezcurra
Karen Goodrowe
Monica Hall-Woods
Stacy Hoffman
Duane C. Kraemer
Catriona MacCallum
Kari Morfeld
Monique Paris
Linda Penfold
Mitch Schiewe
Kristin R. Sieren
Julian Skidmore
Jason Swain
Gabor Vajta
Matt Wheeler
Buck Williams

II. Agenda

1. Welcome and call to order (Loskutoff).
2. Introductions of Parent Committee members present (Loskutoff).
3. Discussion of Terms of Reference draft (Loskutoff).
4. Future Meetings (Loskutoff).
5. Link with Regional Zoo Associations (Loskutoff).
6. Wildlife ART Symposia (Loskutoff).
7. Membership and Objectives of Subcommittees:
    A. Research Subcommittee (Krisher and Swanson).
    B. Technology (Loskutoff).
    C. Health and Safety (Loskutoff).
    D. Regulatory (Crichton).
8. Other Business

III. Action Items (summarized from the minutes):

CANDES Parent Committee:

1. Revise and complete the Terms of Reference (p.10; Appendix 2) to submit to the IETS Board of Governors for review and approval at the 2002 mid-year teleconference;
2. Co-Chairmen of the four Subcommittees will select members for their respective Subcommittees (pages 12-16);
3. A two-day working meeting (p. 11) will be held on Saturday-Sunday, 27-28 April 2002 at the Henry Doorly Zoo in Omaha, Nebraska to further discuss goals, prioritize objectives and draft Terms of References for each Subcommittee;
4. Following the mid-year working meeting, a report will be prepared for the IETS Board of Governors for review and approval at their mid-year teleconference. This report will then be submitted for publication in the Embryo Transfer Newsletter (p. 11).
5. A request was posed from Farstad for the CANDES Parent Committee to consider providing an official statement of ethical practice, which is often required to perform reproductive biotechniques on various taxa (p. 16). This point will be placed on the agenda for further discussion at the April working meeting.
6. A suggestion was submitted by the 2001-2002 IETS Board of Governors that all future Annual Conference Program Chairmen include a time slot in the main program for reports from both the HASAC and CANDES Parent Committee (p. 17). The Parent Committee Chairman (Loskutoff) will prepare and present this report for the 2003 Annual Conference.

Research Subcommittee (pp. 12-14):

1. A limited list of taxa will be identified to target initial focus upon for developing resource guides which would contain information that would provide a starting point for the application of assisted reproductive techniques in CANDES;
2. The CANDES Parent Committee Secretary (Pickard) will work with the Co-Chairmen (Krisher and Swanson) and with the Chairman of the IETS Website Ad Hoc Committee (R. Fayrer-Hosken) to determine the most effective manner in which IETS members can access the information;

Technology Subcommittee (pp. 14-15):

1. A challenge was posed to this Subcommittee to explore the prospect of preparing a list of alternative strategies that may be used to overcome certain limitations that may be inherent to certain protocols. For example, it has been published that there can be simpler alternatives to culturing embryos that would eliminate the need for CO_2 incubators (e.g., gassing tubes in a waterbath; microcell chambers on a slide warmer; replacing atmosphere with breath to reduce oxygen concentration, etc.).
2. Identify and prioritize areas in need of technological develop to permit the application of assisted reproductive procedures in diverse taxa;
3. The Subcommittee should engage dialog with companies that welcome ideas for new designs, or already have access to design modifications that may be useful for non-domestic species (e.g., a catheter designed for use in domestic dogs that may be effective in other canids such as foxes or wolves).

Health and Safety Subcommittee (p. 15):

1. In discussions that actually took place after the adjournment of the CANDES Parent Committee meeting, a major objective of this Subcommittee was identified to be the preparation of a detailed review of all scientific literature (and not limited to CANDES) pertaining to pathogen interactions with semen. Loskutoff and Holt agreed to develop a thorough and comprehensive review of all available scientific literature pertaining to pathogen interactions in semen. This document will include summaries of all pertinent references and will be reviewed by the CANDES Health and Safety Subcommittee on a confidential basis (since unpublished data may also be included). The review will be completed in one year and will be made available to the members of the HASAC Research Subcommittee in time for the 2003 IETS Annual Conference in New Zealand.

Regulatory Subcommittee (pp. 15-16):

1. A major goal of this Subcommittee will be to clarify, on a country-by-country basis, what is required to obtain the appropriate permits for legally transporting animal gametes, embryos, tissues and excretory products;

2. The Subcommittee will also explore the creation of a common format that would address all of the possible concerns when filing for permits, and that this form may be made available via the IETS website;
3. An objective that was identified by Spindler was to compile a list that also specifies which biological materials are not regulated and, therefore, do not need specific permits for transport.

IV. Minutes

1. Welcome and call to order: Loskutoff called the meeting to order at 08:10 and greeted the IETS annual conference delegates in attendance (~40 present; many late-comers did not sign roster).

2. Background: Loskutoff explained what led to the formation of the new Parent Committee which is the second Parent Committee in addition to the Health and Safety Advisory Committee (HASAC) to function under the umbrella of the IETS. The directive was made by the 2001-2002 IETS President, Dr. Jim Robl, who called on Loskutoff (current member of the IETS Board of Governors) to explore the possibility as a means to potentially attract new members to the IETS. Loskutoff submitted a proposal to the 2001-2002 IETS Board of Governors (Appendix 1) to form a new Parent Committee on Companion Animals, Non-Domestic and Endangered Species (CANDES) which included a table that illustrated a steadily growing increase in the numbers of abstracts and papers focusing on these species (range: 5-18%) presented at the IETS annual conferences over the last 10 years. The Board approved the provisional formation of the CANDES Parent Committee (to be re-evaluated after two years) during their mid-year teleconference on 1 July 2001, with Loskutoff serving as the initial Parent Committee Chairman.

3. Terms of Reference: To describe the general objectives and structure of the CANDES Parent Committee to the IETS membership present, Loskutoff presented specific sections of a draft copy of the Terms of Reference that was submitted to the IETS Board of Governors on 11 January 2002 (Appendix 2). Firstly, the definition and goals of the Parent Committee were described by reading the Preamble and Mission Statement. Loskutoff then explained that the Parent Committee will consist of a Chairman (initially Loskutoff), appointed by the IETS Board of Governors, and the Chairman will appoint a Secretary (Pickard), Chairmen of various Subcommittees and their respective members. The activities of all members of the Parent Committee will be subject to review and renewal every two years (i.e., the Subcommittee members by the Subcommittee Chairmen, the Subcommitee Chairmen and Parent Committee Secretary by the Parent Committee Chairman, and the Parent Committee Chairman by the IETS Board of Governors). Loskutoff explained that for the initial two years during the formation of the Parent Committee, two Co-Chairmen were appointed for each of four Subcommittees: 1) Research (Krisher and Swanson), 2) Regulatory (Crichton and O'Brien), 3) Technology (Damiani and Hildebrandt) and 4) Health and Safety (Holt and Loskutoff). Loskutoff then read the general descriptions of each of those Subcommittees in the draft Terms of Reference for the Parent Committee, but indicated

that each of the Subcommittees will organize their own specific Terms of References, prioritize goals and select members. Membership in the Subcommittees was solicited from the IETS annual conference delegates in attendance and sign-up sheets were circulated. It was emphasized that membership in the IETS was a requirement for all CANDES Parent Committee members.

4. Future Meetings: Loskutoff mentioned that a two-day working meeting has been planned and will be held at the Henry Doorly Zoo in Omaha, Nebraska, USA on Saturday and Sunday, 27-28 April 2002. The Henry Doorly Zoo will sponsor the accommodations and meals for all CANDES Parent Committee members during this meeting, but not travel expenses to and from Omaha (however, sponsorship to assist with travel expenses will be sought after for future working meetings). This first two-day working meeting is not compulsory; however, Parent Committee members are strongly encouraged to participate. During this first working meeting, alternative strategies for communication (e.g., electronic) between members will be discussed.

The report from the working meeting will be submitted to the IETS Board of Governors for review during their mid-year teleconference. Upon approval the report will be submitted for publication in the Embryo Transfer Newsletter.

The meeting will overlap with the first two-day working meeting (26-27 April 2002) of the American Zoo and Aquarium Association (AZA) Reproduction Advisory Group (RAG) that is co-chaired by Karen Goodrowe (Toronto Zoo) and Naida Loskutoff. A draft letter that is being sent to potential members of the new AZA RAG Steering Committee is attached (Appendix 3) that provides more information as well as their agenda which will clearly indicate the potential for valuable information exchange between these two groups. In the future, the annual joint working meetings for the IETS CANDES Parent Committee and the AZA RAG (and possibly other zoo association advisory groups) will correspond with the International Symposia on Assisted Reproductive Technology for the Conservation and Genetic Management of Wildlife. The next symposium will be held on Saturday and Sunday, 28-29 September 2002 at the Henry Doorly Zoo (Omaha, Nebraska, USA) and a joint working meeting of the IETS CANDES Parent Committee and the AZA RAG will be held on Friday, 27 September 2002. Again, all CANDES Parent Committee members will receive free accommodations (for Friday through Monday if needed) and meals on the Friday during the working meeting. Travel expenses and registration fees for the second symposium can not be provided at this time; however, sponsorship will be sought after for future symposia to assist CANDES Parent Committee and AZA RAG members with travel expenses and registration fees to enable them to attend the annual working meetings and symposia.

5. Link with Regional Zoo Associations: Loskutoff mentioned that the IETS CANDES Parent Committee members will be encouraged to become involved with their regional zoo associations and presented a table from Appendix 1 listing the 16 primary zoo associations currently in existence. The objective will be to expand the CANDES Parent Committee membership internationally which, as a consequence, would increase the potential benefit to its members.

6. Wildlife ART Symposia: The first International Symposium on Assisted Reproductive Technology for the Conservation and Genetic Management of Wildlife was held on 17-18 January 2001 as a satellite symposium of the 27th annual conference of the IETS. This symposium attracted 201 participants from 17 countries. The proceedings (abstracts with comprehensive reference lists) of the symposium was made available electronically at no cost (ARTSymposia@omahazoo.com) and, to date, over 430 copies have been distributed to 37 countries. The second symposium is scheduled for 28-29 September 2002 (Appendix 4) and will include poster presentations as well as an opportunity for invited speakers and poster presenters to submit complete manuscripts for publication in special issues of one of two scientific, peer-reviewed journals: Zoo Biology, with Karen Goodrowe (Toronto Zoo, Canada) as the guest editor, or Theriogenology, with Rebecca Krisher as the guest editor. The goal of these symposia is to meld the interests of both the IETS CANDES Parent Committee members and the AZA RAG (and potentially other zoo associated reproduction advisory groups). Members of the IETS CANDES Parent Committee and AZA RAG will have input into the topics and speakers that will be included in future symposia.

7. Formation of Subcommittees: Loskutoff mentioned that although she presented her own vision of what she believed the individual Subcommittees should aim to accomplish, she would leave it completely to the Subcommittee Co-Chairmen to formulate their own Terms of References and select their own Subcommittee members. At that time, she gave the floor to Krisher and Swanson to present their views on the goals and objectives of the Research Subcommittee.

> ***Research Subcommittee***: Krisher described that a major objective will be to develop a resource guide that would provide a "starting point" that would allow members to determine realistic expectations for the application of assisted reproductive procedures for specific species, based on the experimental evidence available. A sign up sheet was circulated for membership in this Subcommittee. Krisher mentioned that successful protocols would be solicited from members which would be substantiated by appropriate reference materials and the data base will be organized into a format that would be readily accessible to the IETS membership through the IETS website. The information would be organized by specific taxa and it will be presented clearly through step-by-step protocols, referring back to published data. Although most established protocols for some species may be proprietary (e.g., freezing dog sperm), members will be encouraged to provide information on published protocols for non-domestic species. Swanson mentioned that it will be important to identify a limited group of taxa to target initial focus upon, and perhaps specific individuals to take on those projects (perhaps by forming ad hoc committees?).
>
> *Questions posed to Research Subcommittee from the audience:*
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> i. A comment was made that there are several conservation-based organizations (e.g., CBSG) that have already formulated lists of taxa that should be targeted for consideration in programs such as genome resource banking and if the

Subcommittee was considering that information. Swanson responded that they were indeed aware of those lists and would review them. Loskutoff clarified to the audience that the IETS CANDES Parent Committee was not a conservation organization in terms of identifying taxa or research in greater need of focus, but rather, it has been formed for a much more practical reason and that is to organize and validate (by scientific review) existing information on companion animals, non-domestic and endangered species in order to provide a solid foundation for the application of assisted reproductive technology in these taxa. The Research Subcommittee, therefore, would caution the application of reproductive biotechnologies to those species where sufficient databases have not been accumulated, or where previous research has not proven (by sound scientific experimentation) the feasibility of performing assisted reproduction in a specific taxon. Although the consequence may serve to promote more research on specific taxa in need, it is neither the responsibility nor the directive of the CANDES Research Subcommittee to identify, prioritize and recommend specific research projects on targeted species – but rather – to gather and organize existing information on reproductive research in CANDES, review pertinent literature objectively for scientific soundness and communicate their findings to the IETS membership.

ii. Question posed on the enormity of such a database and how it would be organized. Swanson mentioned that at first, all protocols should be provided – accompanied by appropriate published references – for consideration by the Research Subcommittee to be included in the database. For specific taxa, it may be possible that more than one effective protocol will be made available if those protocols are substantiated by scientific evidence. Loskutoff suggested that the information will be organized in chronological order, and will suggest to the Parent Committee Secretary (Pickard) that we consider presenting the information similar to the manner in which the HASAC lists references for embryo-pathogen interaction studies for specific diseases and taxa on the current IETS website.

iii. Question posed that most IETS members would already have access to such reference material and although most would probably have laboratories to duplicate protocols, many practitioners may find such protocols too technically complex to understand or to perform. Krisher responded that it would be important to present the actual protocols as recommended by the authors or providers; however, that alternatives to certain procedures (based on previous publications or scientific evidence) may be suggested. Loskutoff mentioned that the comment regarding the availability of the reference material was not necessarily accurate. As an example she referred to the proceedings of the first Wildlife ART Symposium where a large proportion of the literature cited came from obscure and remote proceedings that are not readily available, and are certainly not found by most current internet search engines. Loskutoff also mentioned that we might pose this challenge to the Technology Subcommittee to present a list of "alternative strategies" to overcome certain limitations that may

be inherent to specific protocols. For example, it has been published that there can be simpler alternatives to culturing embryos that would eliminate the need for CO_2 incubators (e.g., gassing tubes in a waterbath; microcell chambers on a slide warmer; replacing atmosphere with breath to reduce oxygen concentration; etc.).

Membership roster for the Research Subcommittee:

Paul Bartels
Andras Dinnyes
Robert A. Godke
Wenche Farstad
Rebecca Krisher (Co-Chairman)
Brad Lindsey
Gaia Cecilia Luvoni
Reuben Mapletoft
Gabriela Mastromonaco
Ronaldo Morato
Nei Moreira
Monique Paris
Terri Roth
Rebecca Spindler
William F. Swanson (Co-Chairman)
John Verstegen

Technology Subcommittee: Loskutoff expressed the regrets of Damiani and Hildebrandt who could not attend this inaugural meeting of the CANDES Parent Committee. She then mentioned that her vision of this Subcommittee would be to identify and prioritize areas for technological development in order to be able to apply assisted reproductive technology to diverse taxa. Examples given were the development of instrumentation for transvaginal, ultrasound-guided oocyte retrieval in white rhinoceroses (for a proposed study by Hildebrandt to produce embryos from the critically endangered Northern white rhino and transfer those to the more numerous Southern subspecies) and for instrumentation for transvaginal, ultrasound-guided artificial insemination for species with impenetrable cervices (e.g., giraffids). Besides the development of specialized instrumentation, Loskutoff mentioned that a very important objective of this Subcommittee will be to provide informed counsel as to the feasibility and efficacy of applying some of the more advanced reproductive biotechniques (e.g., cloning) to specific taxa or even extinct species.

Comment posed to Technology Subcommittee from the audience:

Brad Lindsey (AB Technology) mentioned that his company (and probably others such as Cook Veterinary Products) were always willing to discuss the need for the design of specialized instrumentation that would be modifications of existing products. In fact, he mentioned that he currently has a variety of prototypes that

were developed for previous experimental projects (e.g., catheters of various diameters and lengths) that may be available for trials in CANDES.

Membership roster for the Technology Subcommittee:

Paul Bartels
Philip Damiani (Co-Chairman)
Thomas Hildebrandt (Co-Chairman)
Brad Lindsey
Ronaldo Morato
Karine Onclin
Rebecca Spindler

Health and Safety Subcommittee: Loskutoff expressed the regrets of Bill Holt whose flight was delayed which prevented him from attending the meeting. Loskutoff explained that this Subcommittee was the only aspect of the CANDES Parent Committee to parallel the activities of the HASAC – and specifically that of the HASAC Research Subcommittee. The overall goal of the CANDES Health and Safety Advisory Subcommittee would, therefore, serve to regularly review all scientific literature relevant to assessment of infectious disease risks associated with the application of assisted reproductive technology in companion animals, non-domestic and endangered species. In addition, this Subcommittee will assist other CANDES Subcommittees in developing and providing guidelines for the safe production, processing and movement of gametes, tissues and excretory products from these species on a national and international basis. Meetings related to the research update of the CANDES Health and Safety Subcommittee, unlike any of the other Subcommittees, will be closed to the public, because it is likely that some unpublished information may be discussed which will remain confidential to the Subcommittee members.

Membership roster for the Heath and Safety Subcommittee:

Paul Bartels
William V. Holt (Co-Chairman)
Naida M. Loskutoff (Co-Chairman)
Reuben Mapletoft
Nei Moreira

Regulatory Subcommittee: Loskutoff expressed the regrets of O'Brien who was not able to attend this meeting. Crichton described goals that she hoped to accomplish with this Subcommittee. First was to clarify, on a country-by-country basis, what was required to obtain the appropriate permits for the transport of animal gametes, tissues and excretory products. This includes permits from governmental regulatory agencies as well as international wildlife regulatory bodies (e.g., CITES). Loskutoff asked if it might be possible to combine all of the information into a common form that might be acceptable, eventually adopted

and made available through the CANDES Parent Committee link on the IETS website. Crichton also mentioned that, along with the clarification, that they would provide recommendations as to how one can expedite and facilitate the transport of biological materials from CANDES. Another important resource that may be provided on the IETS website will be a list of those biological materials that are not regulated and, therefore, do not need specific permits for movement nationally or internationally.

Questions posed to Regulatory Subcommittee from the audience:

A question was posed as to the possibility of the CANDES Parent Committee providing a "statement of ethical practice" that is often required in various countries to obtain legal permission to carry out reproductive biotechniques on various taxa. There was some caution expressed by several in light of the fact that what is considered "ethical" can vary considerably between countries. Loskutoff posed the question to Reuben Mapletoft, who is the founder of the IETS HASAC (formerly Import-Export Committee) who indicated that the IETS Import-Export Committee did produce a document that discussed recommendations for ethical guidelines for the international marketing of embryos (by D. Hare, ~1985-1986). Loskutoff said that they would obtain a copy of this document from the IETS archives and use this as a template for developing a statement on ethical practices for the CANDES Parent Committee. She further commented that it would not be inappropriate to develop a generalized statement that, with approval of the IETS Board of Governors, may be included on the CANDES Parent Committee link on the IETS website, as many associations (e.g., animal science or zoos) do have formal statements published to this affect. This topic will be discussed further at the working meeting in April.

Membership roster for the Regulatory Subcommittee:

Paul Bartels
Jackie Coulon
Elizabeth G. Crichton (Co-Chairman)
Wenche Farstad
Martha Gomez
Gabriela Mastromonaco
Justine O'Brien (Co-Chairman)
Rebecca Spindler
John Verstegen

8. Other Business: Paul Bartels mentioned that the Wildlife Biological Resource Centre of the Endangered Wildife Trust, will be hosting a workshop on Biological Resource Banking that will be held in Johannesburg, South Africa, just prior to the start of the annual conference of the Pan African Association of Zoological Parks, Aquaria and Botanical Gardens (PAAZAB) on 28-31 May 2002 (www.paazab.org).

A suggestion was submitted by the 2001-2002 IETS Board of Governors (President Robl) that all future Annual Conference Program Chairmen include a time slot in the

main program for reports from both the HASAC and CANDES Parent Committee. Although it was acknowledged that this might not be possible for the 2003 annual conference, the Program Chairmen (Nagai and Piedrahita) reported that they were able to include a CANDES Parent Committee report in their program. The Parent Committee Chairman (Loskutoff) will prepare and present the first report to the IETS membership at the 2003 Annual Conference.

The meeting was adjourned at approximately 10:30 am by Loskutoff and informal discussions continued.

Loskutoff proposed to the Chairman of the HASAC Parent Committee (Thibier) and the Chairman of the HASAC Research Subcommittee (Stringfellow) that the CANDES Health and Safety Subcommittee (Co-Chaired by Loskutoff and Holt) would take on the responsibility of preparing a thorough and comprehensive review of literature pertaining to pathogen interactions with semen. To accomplish this, any and all pertinent literature will be collected, organized and summarized – including reports that focus on domestic livestock. The report will be prepared and reviewed by the CANDES Health and Safety Advisory Subcommittee, and these will be submitted to the HASAC Research Subcommittee in time for their annual meeting at the 2003 IETS Annual Conference in New Zealand. This action resulted from a discussion that was held at the most recent HASAC Research Subcommittee meeting, when it was made clear that a comprehensive review on pathogen interaction studies on semen was beyond the scope of the HASAC, who focus most of their efforts on embryos. Nevertheless, it was acknowledged by both Stringfellow and Thibier that such information would be a valuable contribution to the HASAC who has in recent years included reviews on semen, especially those pertaining to in vitro embryo production.

At the open meeting of the HASAC Parent Committee on Monday, 14 January 2002, the Chairman of the Forms and Certificates Subcommittee (Robertson) requested assistance in identifying appropriate methods for labeling and sealing the newer designs of containers that are increasingly being used for vitrifying embryos (e.g., open pulled straws). A suggestion by the audience (Bousquet) was to contact some of the companies that are actually marketing the products and find out what is available or suggest to them to provide such a necessary counterpart to their products. Loskutoff suggested that the CANDES Regulatory Subcommittee look into this, as vitrification is widely used for these species. A report will be prepared and submitted to Robertson in time for the HASAC working meeting in October, 2002.

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VII. APPENDIX 1

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25 May 2001: *Approved 1 July 2001 (see page 6)*

To: James M. Robl, PhD, IETS President
IETS Board of Governors
From: Naida M. Loskutoff, PhD, IETS Governor
RE: Proposal for the Formation of IETS Parent Committee on Companion Animals & Non-Domesticated Species

At the last meeting of the IETS Board of Governors in Omaha, Nebraska, there was some discussion devoted to how the IETS can attract more sponsors and delegates to the annual conferences. As a result, several directives were made by President Robl, including a proposal to explore the possibility of forming a new parent committee on "non-domestic species" that would function under the umbrella of the IETS, similar to the highly successful Health and Safety Advisory Committee (HASAC).

It is clear that there has been a steadily growing interest in the IETS to include research on embryo transfer technology in species other than domestic livestock, as reflected by an overall tendency for increased attendance at annual conferences associated with higher proportions of papers and posters presented on companion animals and non-domestic species (see Table 1). The 2000 IETS Membership Directory includes information regarding: I. Type of Firm or Institution, II. Services Offered Commercially, III. Not-for-Profit Services (including "d. Preservation of rare or endangered species"), and IV. Species. Of 712 current members who provided this information, 165 (23%) stated that they were either indirectly (by institutional affiliation) or directly involved in programs involving "Non-Human Primates, Dogs/Cats, and Wildlife/Zoo Animals".

Proposal

Assisted reproductive technology is certainly becoming more common for breeding companion animals (e.g., artificial insemination in dogs, which is offered as a service by many veterinary colleges and private companies) and non-domesticated species (e.g., artificial insemination in farmed cervids; embryo transfer for genetic improvement in camelids). As a result, embryo transfer practitioners are finding increasing opportunities, yet are finding a lack of general knowledge on the unique reproductive biologies of, instrumentation available for, or regulatory concerns regarding animals other than domestic livestock. Currently, there is no scientific society that provides a regular forum for those who conduct research on assisted reproduction in companion animals and non-domestic species. The objective of this proposal is to request that the 2001-2002 IETS Board of Governors approve the formation of a parent committee that will focus on relevant issues pertaining to assisted reproduction and embryo transfer technology in these species.

The Health and Safety Advisory Committee (HASAC), one of the hallmarks of the IETS, has played a major role in demonstrating that "embryo transfer can be a safe, effective means of preventing the spread of many pathogens of concern in the international movement of genetic material provided that: 1) proper sanitary collection, handling and transfer techniques are used, and 2) uniform procedures for embryo identification and record keeping are followed accurately to ensure that health certification corresponds to the appropriate embryos" (Stringfellow and Seidel, Manual of the IETS (3rd Ed), 1998). This is certainly an equally important consideration for non-domestic animals (especially rare and endangered species) in light of the fact that there currently are limited facilities available outside North America to provide federally required quarantine for animals imported from Asia and Africa. Concern has prompted the American Zoo and Aquarium Association to adopt measures to increase research and development of assisted reproductive technology and "genome resource banking," or, the cryobanking of tissues, gametes and embryos, as an alternative strategy for maintaining genetic diversity in captive populations and as a safeguard for species survival.

Table 1. Total number of invited papers and published abstracts on "Non-Human Primates, Dogs/Cats, and Wildlife/Zoo Animals" presented at IETS annual conferences over the last 10 years (1992 – 2001).

Year	Venue	Papers	%	Abstracts	%	Total	%	Attendance
1992	Denver	1/11	9.1	6/148	4.0	7/159	4.4	508
1993	Baton Rouge	0/11	0	11/170	6.5	11/181	6.1	503
1994	Melbourne	4/18	22.2	13/194	6.7	17/212	8.0	413
1995	Calgary	4/16	25.0	22/214	10.3	26/230	11.3	516
1996	Salt Lake City	0/14	0	15/212	7.1	15/226	6.6	439
1997	Nice	0/14	0	18/272	6.6	18/286	6.3	581
1998	Boston	0/13	0	14/252	5.6	14/265	5.3	586
1999	Quebec City	0/17	0	24/278	8.6	24/295	8.1	620
2000	Maastricht	7/17	41.2	42/328	12.8	49/345	14.2	712
2001	Omaha	1/16	6.2	57/300	19.0	58/316	18.3	652
2002*	Brazil	2/18	11.1	51/432	11.8	53/450	11.8	~840

*Information added after submission and approval of this proposal.

Although the prevention of disease transmission during germ plasm transfer is an important objective, there are many other issues regarding assisted reproduction in companion animals and non-domestic species that warrant the formation of an independent parent committee. If approved, provisional subcommittees will be formed initially so that more focus can be placed on specific topics in dire need of attention, including:

1. Regulatory Subcommittee. Besides the health and safety concerns when transporting animal tissues, those who work with rare and endangered species have additional restrictions by federal (e.g., United States Fish and Wildlife Department) and international (e.g., CITES, Convention on International Trade of Endangered Species) agencies which are often ill-defined and inconsistent between countries, and may in fact detrimentally affect legitimate conservation programs the same way they carry out their original objectives to control the unlawful commercialism of animal products. For example, although express courier services today can ship practically anywhere in the world within a day or two, the required permits for transporting tiger tissue (fresh, frozen or fixed) can take up to 6 months for issuance. This means that spontaneous attempts to salvage tiger gametes after unexpected or accidental deaths are impossible if the tissues must be sent to facilities in other countries (which is typically the case as many endangered species are found in developing countries).

"Blanket" permits are not always a solution, as each permit typically requires information on the specific individual and has an expiration date of one year after the date of issue.

Another regulatory problem for those that work with non-domestic species is in the permits required for transporting excreta (e.g., feces or urine) used to measure reproductive steroid metabolites to assess reproductive function, schedule assisted reproductive techniques or to detect pregnancies. However, there is definitely a need for stringent regulation as I personally know of institutions in North America that are in possession of cryopreserved semen or tissues collected from animals in foreign countries where undesirable pathogenic agents (e.g., foot-and-mouth virus, rinderpest) are prevalent. It would, therefore, be an important objective of this subcommittee to assist in clearly defining conditions and expediting the safe transport of biological materials, while at the same time holding high standards to prevent inadvertent disease transmission.

2. Methodology (or Procedural Development) Subcommittee. The initial objective of this subcommittee will be to identify and prioritize critical areas in need of research to develop protocols for assisted reproduction in companion animals and non-domestic species. This information can be made available to university and zoo-based research programs to draw upon for student projects. Another important objective of this committee will be to compile information on existing protocols proven to be effective for synchronizing ovarian cycles, artificial insemination, embryo collection, production and transfer, as well as sperm and embryo cryopreservation in these species. The group will be encouraged to organize this information for a diverse array of taxa, with updates and new additions included on a regular basis, and make the report available to IETS members through the IETS website or FASS office.

3. Technology Subcommittee. The goal of this subcommittee will be to identify and prioritize important areas that need technological development to broaden the application of assisted reproduction in companion animals and non-domestic species. For example, it is clear that for certain species, the development of species-specific gonadotropins is necessary to improve success rates for basic procedures (e.g., estrous synchronization). The development of advanced reproductive techniques (e.g., cloning, sperm sorting) is in need of critical evaluation and discussion as indeed are new designs or modifications of equipment such as that used for electroejaculation, ultrasound-guided intrauterine artificial inseminations for use in species with impenetrable cervices (e.g., giraffe and okapi) or transvaginal oocyte retrievals in smaller mammals or those with unique reproductive anatomies. Another important area for development is in the design of equipment with more applicability to field conditions, such as portable incubators, cryopreservation or vitrification units that can function for long periods without electricity.

4. Research (Health & Safety) Subcommittee. It is clear that the methods developed for "disinfecting" in-vivo-derived bovine embryos from specific pathogens are not necessarily effective for in-vitro-produced bovine embryos, or even in-vivo-derived embryos from other species. For that reason, it is important to conduct the appropriate research and examine results on a case by case basis to confidently ascertain the effectiveness of the procedures for each new species. The HASAC Research Subcommittee has performed this task exceptionally well on domestic livestock. However, the overwhelming volume of information on those species has made it necessary for the HASAC Research Subcommittee to limit its focus to only domestic ruminants, horses and pigs, with some attention to relevant research on laboratory animals. This proposed subcommittee will, therefore, serve several important purposes including: 1) review literature on embryo or sperm and pathogen interactions in

companion animals and non-domestic species (which is quite limited at present) and report these to the HASAC Research Subcommittee; 2) identify studies on specific pathogen interactions with gametes or embryos that are in dire need of research and report these to the Methodology (or Procedural Development) Subcommittee; and 3) compile all literature (reference lists) on assisted reproduction in companion animals and non-domestic species and make these available to IETS members via the IETS website or the FASS office.

Annual meetings

The proposed IETS Committee on Companion Animals and Non-Domestic Species will plan to hold a regular annual meeting, and an open report session, at the IETS annual conference, at times that will not conflict with the HASAC subcommittee meetings and open session. To maximize the benefits of this proposed IETS parent committee to its members and the IETS, a two-day working meeting will be organized on an annual basis for all subcommittee members (all of the workshop sessions will be videotaped and made available to those who will not be able to attend this meeting). The Henry Doorly Zoo in Omaha, Nebraska, will host this meeting and sponsor the accommodations and meals but not travel expenses. It is proposed that the working meeting for this IETS parent committee be held in September each year to overlap with the newly formed Reproduction Scientific Advisory Group (SAG) that functions under the auspices of the American Zoo and Aquarium Association (Co-Chairmen: Karen Goodrowe and Naida Loskutoff).

Although the proposed IETS parent committee will be more international in membership and focus on assisted reproductive technology in companion animals and non-domestic species, the goal of the AZA Reproduction SAG is to develop a wider, more integrated approach by enlisting members from a variety of scientific disciplines for correcting or treating non-reproductive animals, as well as enhancing reproductive performances, evaluating reproductive function and/or enhancing the captive propagation of a diverse array of zoo and wildlife species. A primary objective of the AZA Reproduction Advisory Group is to provide a more informed and complete counsel that can be more effective for advising Species Survival Plans and Taxon Advisory Groups on designing successful captive breeding programs. Members of the AZA Reproduction Advisory Group will, therefore, not all be reproductive biologists, but will include those that represent important related disciplines such as endocrinology, genetics (including cytogenetics, molecular genetics and population genetics), nutrition, husbandry, behavior, as well as veterinary medicine (including pathology and epidemiology). Because of the great potential for valuable information exchange between these two groups, I will suggest that the annual working meetings for each will be planned to overlap at the same venue; however, other, more cost-effective formats will also be considered and discussed. Members of the proposed IETS Committee on Companion Animals and Non-Domestic Species from countries outside of North America will be encouraged to become members of their regional zoo associations (Table 2) and develop partnerships with these programs.

Every two years, the Henry Doorly Zoo (Omaha, NE, USA) plans to hold additional symposia on assisted reproduction in non-domestic species, similar to the successful satellite symposium held on January 17-18, 2001 that attracted 201 participants representing 17 countries. The proceedings for the first and all subsequent symposia will be available at no charge for electronic copies by sending requests to: ARTSymposia@omahazoo.com (hard copies also available for $30 to cover printing, binding and mailing) – notices will be placed in the Embryo Transfer Newsletter as well as Embryo-Mail News. The goal is to distribute the information as widely as possible, and the contact information will be used to announce the program and registration details for subsequent symposia (the second planned for the Autumn of 2002) to be held again at the Henry Doorly Zoo. As an example of the global interest by embryo transfer researchers and practitioners in these proceedings, to date over 300 copies have been sent to interested parties in 34 countries (these data available upon request). During the joint annual working meeting, the IETS Committee on Companion Animals and

Non-Domestic Species and the AZA Reproduction Advisory Group will have input into the selection of speakers and topics for subsequent symposia.

Table 2. Primary regional zoo associations.

ALPZA	Latin American Association of Zoological Gardens & Aquariums
AMACZOOA	Mesoamerican & Caribbean Zoo & Aquarium Association
ARAZPA	Australasian Regional Association of Zoological Parks & Aquariums
AZA	American Zoo & Aquarium Association
AZCARM	Mexican Association of Zoos & Aquariums
CAZG	Chinese Association of Zoological Gardens
CAZA	Canadian Association of Zoos & Aquariums
EAZA	European Association of Zoos & Aquaria
FUNPZA	National Foundation of Zoological Parks and Aquaria (Venezuela)
FZG	Federation of Zoological Gardens of Great Britain & Ireland
IZDA	Indian Zoo Directors Association
JAZGA	Japanese Association of Zoological Gardens & Aquariums
PAAZAB	Pan African Association of Zoological Gardens, Aquariums & Botanical Gardens
PKBSI	Indonesian Zoological Parks Association
SEAZA	South East Asian Zoo Association
ZPO	Zoological Parks Organization of Thailand

If approved, letters will go out to all potential members listed in this proposal and an announcement will be placed in the IETS newsletter to describe the new committee and subcommittees and solicit membership. An initial, organizational meeting will be scheduled during the 2002 IETS annual conference in Brazil. At that time, members and subcommittee chairmen will be nominated and presented to the IETS Board of Governors for approval, and we will discuss options for holding the mid-year meeting, including the possibility of using e-mail, video or teleconference formats in place or, or in addition to, the suggestion made above for a joint meeting with the AZA Reproduction Advisory Group. Although no funding will be requested for the first, provisional year (2002-2003), it is anticipated that a minimal budget (not to exceed US$ 5,000) may be requested in subsequent years to help defray travel expenses for subcommittee chairmen and members to attend the annual working meeting in Omaha if that is preferred over the e-mail, video or teleconference formats.

Finally, as suggested by President Robl, I sent this proposal first to the members of the IETS HASAC. The response was overwhelmingly positive and in support of the formation of this new proposed committee. I would appreciate any comments and/or suggestions you might have and will be pleased to provide any further information.

Respectfully Submitted,

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VIII. APPENDIX 2

INTERNATIONAL EMBRYO TRANSFER SOCIETY (IETS)

TERMS OF REFERENCE*

OF THE

IETS PARENT COMMITTEE ON
COMPANION ANIMALS, NON-DOMESTIC & ENDANGERED SPECIES (CANDES)

I. PREAMBLE

The Parent Committee on Companion Animals, Non-Domestic and Endangered Species (CANDES) of the International Embryo Transfer Society *will be* an advisory committee, technically specialized in comparative vertebrate reproductive physiologies and the application of reproductive biotechnologies in companion animals (including cats, dogs, birds, amphibian and reptiles and excluding horses), non-domestic species (including farmed animals such as buffalo, cervids, camelids, ratites and canids, in addition to a diverse array of zoo animals) as well as their endangered species counterparts. It *will* provide a unique and valuable resource to the IETS membership and *will* respond to their questions and requests for advice related to those matters both at a national and international level. It *will* submit recommendations based on current scientific knowledge to the IETS Board of Governors to further provide guidance and advice to international governmental regulatory agencies and organized conservation programs, such as those of regional zoo associations as well as the World Conservation Union (IUCN) by direct liaison with the Conservation Breeding Specialist Group, Species Survival Commission.

II. MISSION STATEMENT

The aim of the IETS CANDES Parent Committee *will be* to regularly and extensively review relevant literature pertaining to reproduction in companion animals and non-domestic species in order to provide a foundation for the safe (from a disease standpoint) and effective application of embryo transfer and related technologies. An important goal of the Committee *will also be* to provide the IETS membership informed counsel that can instruct and advise on the technical feasibility and realistic expectations (based on previous scientific evidence) of the application of some of the more basic (e.g., sperm or embryo cryopreservation) to the most technically advanced (e.g., cloning) reproductive biotechnologies to companion animals and non-domestic species. The IETS CANDES Parent Committee will regularly communicate their activities to the IETS Board of Governors in the form of written reports and, with Board approval, will relate information directly to the IETS membership.

III. SCOPE

The activities of IETS CANDES Parent Committee *will be* wide ranging and *will*: 1) summarize the results of previous applications of assisted reproductive techniques in companion animals and non-

*Initial draft submitted to the IETS Board of Governors for review (January 2002).

domestic species and provide details for proven and established protocols; 2) develop and provide instructional information (including thorough reference lists) on the reproductive patterns and strategies of unique species and methods to control their reproduction; 3) identify areas in need of further research and development to allow the application of embryo transfer and related technologies to unique species; 4) clearly define international regulatory requirements to provide guidance for the safe and legal transport of tissues and germplasm from non-domestic and endangered species for breeding or research purposes; and 5) develop, with approval of the IETS Board of Governors, an electronic system or IETS website link that would transfer pertinent information to the IETS membership.

IV. STRUCTURE

The IETS CANDES Parent Committee *will be* organized as four Subcommittees:

1. Regulatory Subcommittee. Besides the health and safety concerns when transporting animal tissues, those who work with rare and endangered species have additional restrictions by federal (e.g., United States Fish and Wildlife Department) and international (e.g., CITES, Convention on International Trade of Endangered Species) agencies which are often ill-defined and inconsistent between countries. An important objective of this subcommittee *will be* to assist in clearly defining conditions and requirements to facilitate and expedite the safe and legal transport of biological materials, while at the same time holding high standards to minimize the potential of inadvertent disease transmission, without unduly restricting technological advances in research and conservation programs.

2. Research Subcommittee. The initial objective of this subcommittee *will be* to identify and prioritize critical areas in need of research to develop protocols for embryo transfer and related technologies in companion animals and non-domestic species. This information *can be* made available to university and zoo-based research programs to draw upon for student projects. Another important objective of this committee *will be* to compile information on existing protocols proven to be effective for synchronizing ovarian cycles, artificial insemination, embryo collection, production and transfer, as well as sperm and embryo cryopreservation in these species. This information *will be* compiled for a diverse array of taxa, with updates and new additions included on a regular basis, and written reports *will be* made available to IETS members through the IETS website or FASS office.

3. Technology Subcommittee. The goal of this subcommittee *will be* to identify and prioritize important areas that need technological development to broaden the application of embryo transfer and related technologies in companion animals and non-domestic species, including the design of equipment with more applicability to field conditions, such as portable incubators, cryopreservation or vitrification units that can function for long periods without electricity.

4. Health & Safety Subcommittee. It is clear that the methods developed for "disinfecting" in-vivo-derived bovine embryos from specific pathogens are not necessarily effective for in-vitro-produced bovine embryos, or even in-vivo-derived embryos from other species. For that reason, it is important to conduct the appropriate research and examine results on a case by case basis to confidently ascertain the effectiveness of the procedures for each new species. The HASAC Research Subcommittee has performed this task exceptionally well on domestic livestock. However, the overwhelming volume of information on those species has made it necessary for the HASAC Research Subcommittee to limit its focus to only domestic ruminants, horses and pigs, with some attention to relevant research on laboratory animals. This proposed subcommittee will, therefore, serve several important purposes including: 1) review literature on embryo or sperm and pathogen interactions in companion animals and non-domestic species (which is quite limited at present) and report these to the HASAC Research

Subcommittee; and 2) identify studies on specific pathogen interactions with gametes or embryos that are in dire need of research and report these to the CANDES Methodology Subcommittee.

V. APPOINTMENT AND PROCESS

The IETS CANDES Parent Committee *will be* led by a Chairman nominated from the IETS membership by the IETS Board of Governors. The continuation of the appointment will be subject to approval of the IETS Board of Governors after review every two years and renewable for a total of six years. The CANDES Parent Committee Chairman will designate a Secretary from the IETS membership, who will be confirmed by the IETS Board of Governors and whose appointment will be reviewed by the CANDES Parent Committee every two years and renewable for a total of six years. Each of the four Subcommittees *will be* led initially by two Co-Chairmen, designated by the CANDES Parent Committee Chairman from the IETS membership and confirmed by the IETS Board of Governors. The Subcommittee Co-Chairmen will serve for a period of two years, renewable for a total of six years by agreement of the CANDES Parent Committee and confirmation by the IETS Board of Governors. The Subcommittee Chairmen will select the members of their respective subcommittees, drawn from the IETS membership, whose appointments will be subject to review by the Subcommittee Chairmen every two years, renewable for a total of six years. The IETS CANDES Parent Committee will, therefore, consist of a Chairman, Secretary, Subcommittee Chairmen and all of the Subcommittee members.

All members of the IETS CANDES Parent Committee *will be* required to be members of the IETS and to volunteer their participation without any remuneration. Their membership will be approved formally by a letter from the IETS CANDES Parent Committee Chairman. To the extent possible, the IETS CANDES Parent Committee membership will be balanced between geographic areas and continents, between public and private sectors and between various fields of expertise: scientists, practitioners, administration, commerce, etc.

VI. SUPPORTING STRUCTURE

The IETS CANDES Parent Committee is an instrument of the IETS Board of Governors to which it reports to after each of its meetings. No public action or initiative of the IETS CANDES Parent Committee can be taken without the approval of the President of the IETS Board of Governors. Internal communication to the IETS membership is the responsibility of the IETS CANDES Parent Committee Chairman, after receiving approval from the IETS Board of Governors. All members, including the Secretary and Subcommittee Chairmen, will communicate information on behalf of the IETS CANDES Parent Committee only with the formal approval of the IETS CANDES Parent Committee Chairman. External communication is the privilege of the IETS Board of Governors. Only the IETS CANDES Parent Committee Chairman communicates externally and that with the formal approval of the President of the IETS Board of Governors.

VII. FREQUENCY AND LOCATION OF MEETINGS

The IETS CANDES Parent Committee will meet at least once annually at the time and location of the IETS annual conferences. Two meetings will be scheduled each year to accelerate consultations and to respond efficiently to inquiries from the IETS membership and others. The second meeting will be organized as a two day working meeting that will be held initially, and hosted by, the Center for Conservation and Research at the Henry Doorly Zoo in Omaha, Nebraska. This working meeting will overlap annually with the two day working meeting of the Reproduction Advisory Group (RAG) of the American Zoo and Aquarium Association (AZA), and every two years with the International

Symposium on Assisted Reproductive Technology for the Conservation and Genetic Management of Wildlife. The programs for these symposia will be designed to reflect the interests of both the IETS CANDES Parent Committee and the AZA RAG.

VIII. SUPPORT

The IETS Business Office will be requested only to relay communications between the IETS CANDES Parent Committee and the IETS Board of Governors. In addition, the IETS Business Office will be requested to communicate Board-approved information to the IETS membership by way of the Embryo Transfer Newsletter or the IETS website. No financial support from the IETS will be requested for the first provisional year (2001-2002) for the organization and establishment of the IETS CANDES Parent Committee, however, a modest budget allocation *may be* requested in future years to assist members with travel expenses to attend the annual working meetings.

IX. APPENDIX 3

THE AMERICAN ZOO AND AQUARIUM ASSOCIATION

18 January 2002

To: AZA Members
Cc: SSP & TAG Veterinarians
RE: Formation of new AZA Reproduction Advisory Group

Dear Friends and Colleagues:

At the 2001 annual conference of The American Zoo and Aquarium Association (AZA) in St. Louis, the new Reproduction Advisory Group (RAG) was announced in an inaugural meeting. Karen Goodrowe (Toronto Zoo) and Naida Loskutoff (Henry Doorly Zoo) will serve initially as the RAG Co-Chairmen, and we are now inviting AZA members to serve on the RAG Steering Committee. The goals for the AZA RAG are to provide a more informed and complete counsel that can be more effective for advising Species Survival Plans and Taxon Advisory Groups on methods for correcting or treating non-reproductive animals, as well as enhancing their reproductive performances. Another important and timely function of the RAG will be to provide AZA members guidance from a panel of scientific experts that can advise and provide informed position statements on the validity and applicability of some of the more basic (e.g., artificial insemination and embryo transfer) to more advanced reproductive technologies (e.g., sex-selection or cloning) to conservation programs for rare or endangered species.

A two-day working meeting has been planned for the AZA RAG that will be held on Friday and Saturday, 26-27 April 2002 at the Henry Doorly Zoo (Omaha, NE) who will host this meeting and sponsor the accommodations and meals but not travel expenses (see tentative agenda at the end of this letter). At that time the RAG Steering Committee members will identify areas that need consideration, define and prioritize objectives and develop action plans for 2002. The two-day RAG working meeting will overlap with the first working meeting (27-28 April 2002) of the newly formed Parent Committee on Companion Animals, Non-Domestic and Endangered Species (CANDES) that functions under the umbrella of the International Embryo Transfer Society (IETS). Although the RAG Steering Committee will consist of AZA members from a variety of scientific disciplines (e.g., Nutrition, Genetics, Behavior, Husbandry and Veterinary Medicine), the CANDES Parent Committee will consist of IETS members that are technically specialized in comparative vertebrate reproductive physiology and the application of assisted reproductive technology in a diverse array of taxa (for more information, see the attached Terms of References for the IETS CANDES Parent Committee). Members of the IETS CANDES Parent Committee will also represent countries outside of North America, who will be encouraged to become members of their own regional zoo associations and develop partnerships with these programs. Because of the great potential for valuable information exchange between these two groups, the working meetings are planned to overlap at the

same venue; however, other, more cost-effective formats will also be considered and discussed for future meetings.

A second (optional) joint working meeting is planned for Friday, 27 September 2002 to correspond with the Second International Symposium on Assisted Reproductive Technology for the Conservation and Genetic Management of Wildlife to be held at the Henry Doorly Zoo on 28-29 September 2002 (program attached). Again, the Henry Doorly Zoo will sponsor the accommodations and meals for AZA RAG Steering Committee members on that Friday and will provide free accommodations during the symposium on Saturday and Sunday; however, registration fees or travel costs cannot be provided at this time, as we must have a minimum number of registrants to meet expenses (sponsorship will be solicited for future symposia to assist AZA RAG Steering Committee and IETS CANDES Parent Committee members with travel expenses in order to attend the annual working meetings) . The first symposium held on 17-18 January 2001 attracted 201 participants representing 17 countries and over 400 copies of the proceedings have so far been distributed to 37 countries by making them available electronically at no cost (additional requests may be sent to: ARTSymposia@omahazoo.com). The primary goal of holding these symposia will be to meld the interests of both groups and provide a forum for discussion. During their joint annual working meetings (which in subsequent years will be planned to be held in September-October to correspond with the symposia), the IETS CANDES Parent Committee and the AZA RAG will have input into the selection of speakers and topics for future symposia which are planned to be held every two years.

If you would like to become a member of the AZA RAG, please complete the attached AZA Institutional Representative Designation Form and return it to either Karen Goodrowe or Naida Loskutoff by the end of February 2002. Membership will be confirmed by a formal letter that will be sent by the RAG Co-Chairmen by 15 March 2002. We look forward to hearing from you and to working with you on the AZA RAG.

Yours Sincerely,

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Tentative agenda for the first two-day working meeting of the AZA RAG

Day 1 (Friday, 26 April 2002)

08:00 – 10:00: Introductions; all participants state why there is a need for a "Reproduction" advisory group and provide at least one goal they would like to see accomplished (see list of examples on following page).

10:00 – 10:30: Break

10:30 – Noon: Combine similar topics and prioritize topics of major concern for break-out working groups to expand on objectives. Select members with diverse backgrounds for each working group; select facilitator and two recorders (one for summary comments on flip chart, the second for detailed notes on laptop computer).

Noon – 13:00: Lunch

13:00 – 16:00: Working groups elaborate and expand on objectives for topics ranked as highest priority and formulate position statements.

16:00 – 17:00: Working groups prioritize formulated statements for draft action plan on assigned topics.

17:00 – 18:00: Plenary session – working groups report to all participants. Open discussion.

18:00 – 20:00: Cocktails and Dinner

Day 2 (Saturday, 27 April 2002)

09:00 – Noon: Working groups reconvene and fine tune objectives (based on general discussion the previous day). Propose action plan for their topics. Assign or suggest additional advisors or voluntary consultants to review draft action plan and compile information.

Noon – 13:00: Lunch

13:00 – 15:00: Plenary session – working groups report action plan. Decision if Subcommittee should be formed to complete document (Chairman and members suggested) which will contain detailed information on the topic for a diverse array of species.

15:00 – 17:00: Review initial goals list (add or remove goals, modify priorities); discuss name for SAG (results of initial survey plus new suggestions); discuss date/time for annual working meeting (link with IETS parent committee on Non-Domestic Species and Companion Animals) and suggestions for additional advisors or voluntary consultants that should be contacted.

Suggested Topics for Break-Out Working Groups:

1. Create AZA website link for general information on taxa/groups or topics, including an e-mail address for requesting more detailed information on specific questions (that can be answered by specific advisors or voluntary consultants).
2. Compose/compile and publish regular reports on important topics applicable to a diverse array of taxa.
   i. Addressing and possibly overcoming subfertility or infertility in older animals (especially for SSP taxa with aging founder populations);
   ii. Optimizing care (nutritional, husbandry, veterinary) of pregnant animals/neonates;
   iii. Describing potential "stressors" (i.e., environmental, social, etc.) that may negatively influence fecundity;
   iv. Suggesting specialized environmental conditions that have proven success in breeding programs for unique taxa (e.g., marine vertebrates/invertebrates);
   v. Defining protocols for potentially inducing fertility in seasonally non-reproductive animals (e.g., light, humidity, temperature manipulations; exogenous hormone treatments);
   vi. Providing recommendations for properly assessing reproductive function in females (e.g., detecting pregnancy or ovarian cyclicity) using either remote or non-invasive methods (e.g., blood, fecal or urinary hormone measurements; ultrasound examinations), including contact information on available facilities and estimated costs for services;
   vii. Listing contact information for veterinarians for consultation regarding specific medical conditions affecting reproduction in male or females animals;
   viii. Listing contact information for geneticists for consultation regarding infertilities with possible or suspected genetic origins;
   ix. Identifying symptom profiles for diseases that should be considered in light of unexplained reproductive disorders or problems and providing contact information for diagnostic laboratories;
   x. Documenting all drugs (including those used for chemical immobilizations) or that can have a direct affect on normal reproductive function;
   xi. Identifying general areas in critical need of research that can be made available to conservation biology-based research programs in zoos and universities;
   xii. Identifying specific needs in technological developments for application to non-domestic species (e.g., species-specific gonadotropins; electroejaculation equipment for a diverse array of species; modified instrumentation for ultrasound or assisted reproduction such as artificial insemination);
   xiii. Providing descriptions and accurate estimations on the current status and success rates of basic assisted reproductive techniques (e.g., semen collection and cryopreservation; AI; embryo collection or production and

transfer). Proven protocols and reference lists on various taxa should be compiled and published.

xiii. Providing clear explanations and expert advise on the practical applications of some of the more technologically advanced reproductive techniques (e.g., cloning, sex selection by embryo biopsy or sorting sperm).

X. APPENDIX 4

The Second International Symposium on Assisted Reproductive Technology (ART) for the Conservation and Genetic Management of Wildlife 28-29 September 2002

Wild Kingdom Pavilion, Henry Doorly Zoo, Omaha, Nebraska, USA

Poster Presentations

There will be no formal poster session. Posters will be displayed in the Wild Kingdom Pavilion foyer throughout the symposium and abstracts included in the proceedings.

Main Program

Saturday, 28 September 2002

08:00-08:15 Welcome & Introduction (Naida Loskutoff, Henry Doorly Zoo CCR, Omaha, NE, USA)

08:15- 12:00 Session 1: Environmental Effects on Reproduction
Chairman: Cheryl Asa, St. Louis Zoo, St. Louis, MO, USA

08:30-09:00 Effects of land development on reproduction *in situ*
(Sam Wasser, University of Washington, Seattle, WA, USA)

09:00-09:30 Effects of environmental pollutants on reproduction *in situ*
(Tim Gross, University of Florida, Gainesville, FL, USA)

09:30-10:00 Effects of environmental pollutants on reproduction *ex situ*
(Bill Lasley, University of California, Davis, CA, USA)

10:00-10:30 Coffee/Tea Break

10:30-13:00 Session 2: Social Influences on Reproduction
Chairman: Janine Brown, National Zoological Park, Smithsonian Institute Washington, DC, USA

10:30-10:50 Social suppression of reproduction in diverse taxa
(Tessa Smith, Chester College, Chester, United Kingdom)

10:50-11:10 Impacts of housing and social environment on reproduction
(Nancy Pratt, Disney's Animal Kingdom, Orlando, FL, USA)

11:10-11:30 Behavioral predictors of reproductive status.
(Suzanne MacDonald, York University, Toronto, Ontario, Canada)

11:30-11:50 Using cross-institutional behavior surveys to study relationships between animal temperament and reproduction
(Kathy Carlstead, Honolulu Zoo, Honolulu, Hawaii, USA)

11:50-12:10 Studying the impact of stress using survey information observations & corticoid analyses (Nadja Wielebnowski, Brookfield Zoo, Brookfield, IL, USA)

12:10-12:30 Correlating ethological and physiological parameters as indicators of well-being in okapi, *Okapia johnstoni* (Leanne Olsen, Dallas Zoo, Dallas, TX, USA)

12:30-13:00 Panel Question & Answer Period (Smith, Pratt, MacDonald, Carlstead, Wielebnowski & Olsen)

13:00-14:00 Lunch

14:00- 17:00 Session 3: Husbandry Concerns in Breeding Programs
Chairman: Lynn Patton, San Diego Zoo CRES, San Diego, CA, USA

14:00-14:20 Handling and restraint designs that facilitate assisted reproduction in diverse species (Evan Blumer, The Wilds, Cumberland, OH, USA)

14:20-14:50 Feed composition problems affecting health and reproduction
(Mary Allen, National Zoological Park, Smithsonian Institute, Washington, DC, USA)

14:50-15:10 Role of training in reproduction of zoo animals
(Marty MacPhee, Disney's Animal Kingdom, Orlando, FL, USA)

15:10-15:30 Role of enrichment in reproduction of zoo animals
(Jill Mellen, Disney's Animal Kingdom, Orlando, FL, USA)

15:30-16:00 Coffee/Tea Break

16:00-16:30 Panel Question & Answer Period (Blumer, Allen, MacPhee & Mellen)

16:30-16:50 Captive propagation of marine vertebrates, e.g., sea horses, pipefish and seadragons (Jorge Gomezjurado, National Aquarium, Baltimore, MD, USA)

16:50-17:10 Captive propagation of marine invertebrates, e.g., coral
(Charles Delbeek, Waikiki Aquarium, Hawaii, USA)

17:10-18:00 Cocktails in Kingdom of the Seas Aquarium, Henry Doorly Zoo

18:00-20:00 Dinner at the Treetops Restaurant, Henry Doorly Zoo

Sunday, 29 September 2002

08:00-10:30 Session 4: Veterinary Concerns in Breeding Programs
Chairman: Bill Swanson, Cincinnati Zoo CREW, Cincinnati, OH, USA

08:00-08:20 Pathogenic agents that can directly or indirectly affect fertility
(Dominic Travis, Lincoln Park Zoo, IL, USA)

08:20-08:50 Reproductive problems directly attributable to long-term captivity
(Robert Hermes, Institute of Zoo Biology and Wildlife Management, Germany)

08:50-09:10 Reproductive diseases resulting from contraceptive treatments
(Linda Munson, University of California, Davis, CA, USA)

09:10-09:30 Potential for inadvertent disease transmission in assisted reproduction programs
(Kay Riddell, Auburn University, Auburn, AL, USA)

09:30-09:50 Use of embryo transfer to eliminate specific pathogenic agents
(David Stringfellow, Auburn University, Auburn, AL, USA)

09:50-10:10 Potential disease risks associated with advanced embryo technologies in mammals induced by modificiation of the embryonic environment, embryo manipulation and retroviral activation
(Paul J. Booth, Danish Institute of Agricultural Sciences, Denmark)

10:10-10:30 Procedures for disinfecting semen prior to cryobanking and assisted reproduction
(Kari Morfeld, Henry Doorly Zoo CCR, Omaha, NE, USA)

10:30-11:00 Coffee/Tea Break

11:00-13:00 Session 5: *Ex Situ* Population Management
Chairman: Budhan Pukazhenthi, National Zoological Park, Smithsonian Institute, Washington, DC, USA

11:00-11:20 Giant panda conservation program
(Nancy Czekala, San Diego Zoo CRES, San Diego, CA, USA)

11:20-11:40 Cytogenetic considerations in planning breeding programs
(Oliver Ryder, San Diego Zoo CRES, San Diego, CA, USA)

11:40-12:00 Inbreeding and heritable diseases in captive populations
(Bob Barber, Henry Doorly Zoo CCR, Omaha, NE, USA)

12:00-12:20 Important phylogenetic considerations when identifying and segregating subspecies (Dan York, Hillsdale College, Hillsdale, MI, USA)

12:20-12:40 Ex situ conservation of plant genetic resources (Christina Walters, USDA-ARS National Center for Genetic Resources Preservation, Fort Collins, CO, USA)

12:40-13:00 Recovery of the Puerto Rican crested toad, *Peltophryne lemur*: *ex situ* and *in situ* population management
(Bob Johnson, Toronto Zoo, Scarborough, Ontario, Canada)

13:00-14:00 Lunch

14:00-15:00 Session 6: *In Situ* Population Management
Chairman: Onnie Byers, Conservation Breeding Specialist Group, Apple Valley, MN, USA

14:00-14:20 Madagascar population genetics
(Ed Louis, Henry Doorly Zoo CCR, Omaha, NE, USA)

14:20-14:40 Tiger conservation programs
(Doug Armstrong, Henry Doorly Zoo CCR, Omaha, NE, USA)

14:40-15:00 Population management at Pilanesberg Nature Reserve, Northwest Province, South Africa: an ecologist's perspective
(Gus van Dyk, Northwest Parks Board, Northwest Province, Republic of South Africa)

15:00-15:20 Population management at Kruger National Park, Mpumlanga Province, South Africa: a veterinarian's perspective
(Markus Hofmeyr, National Parks Board, Republic of South Africa)

15:20-15:40 Population management at Point Reyes National Seashore, California, USA: a behavioral physiologist's perspective
(Susan Shideler, University of California, Davis, CA, USA)

15:40-16:00 Coffee/Tea Break

16:00-18:30 Session 7: Technological Advancements in Assisting Reproduction
Chairman: Rebecca Krisher, Purdue University, West Lafayette, IN, USA

16:00-16:20 Novel instrument designs to facilitate assisted reproduction in non-domestic animals (Thomas Hildebrandt, Institute of Zoo Biology and Wildlife Research , Germany)

16:20-16:40 Use of sex-sorted sperm and ICSI for skewing sex ratios as a population management strategy
(Justine O'Brien, University of Sydney, Sydney, New South Wales, Australia)

16:40-17:00 Xenotransplantation and its potential role in assisted reproduction and animal conservation (Monique Paris, Monash University, Clayton, Victoria, Australia)

17:00-17:20 The production of recombinant, homologous gonadotropins for use in assisted reproduction programs for unique species
(Stacy Hoffman, Henry Doorly Zoo CCR, Omaha, NE, USA)

17:30-19:00 Panel Discussion on Cloning
Moderator: Karen Goodrowe, Toronto Zoo, Scarborough, Ontario, Canada

Panel: Philip Damiani, Audubon Research Center, New Orleans, LA, USA
Oliver Ryder, San Diego Zoo CRES, San Diego, CA, USA
Duane C. Kraemer, Texas A & M University, College Station, TX, USA
John Critser, University of Missouri, Columbia, MO, USA
Bill Holt, Institute of Zoology, London, UK
Paul J. Booth, Danish Institute of Agricultural Sciences, Denmark

19:00-21:00 Cocktails and hors d'oeuvres in the Desert Dome

Relevant Conference/Meeting Dates in September – October, 2002:

American Zoo and Aquarium Association (AZA) national conference:
10 – 14 September 2002 (Fort Worth, Texas, USA)

Joint working group meetings of
International Embryo Transfer Society (IETS) parent committee on Companion Animals, Non-Domestic & Endangered Species (CANDES)
- and the –
AZA Reproduction Advisory Group (RAG) steering committee:
27 September 2002 (Henry Doorly Zoo, Omaha, Nebraska, USA)

American Association of Zoo Veterinarians annual conference:
6 – 10 October 2002 (Milwaukee, Wisconsin, USA)

United States Animal Health Association (USAHA) annual conference:
17 – 24 October 2002 (St. Louis, Missouri, USA)

The Second International Symposium on Assisted Reproductive Technology (ART) for the Conservation and Genetic Management of Wildlife
28-29 September 2002 (Saturday – Sunday)

Registration Information

Deadline for Submission of Abstracts for Poster Presentations: 1 August 2002

Registration Fee: $200 Per Person, Includes

Final program; printed copy of proceedings; three coffee/tea breaks per day (early and mid-morning, afternoon); lunch on both days; cocktails (open beer and wine bar) each evening; dinner on Saturday evening; and hot hors d'oeuvres on Sunday evening; shuttles to/from Omaha's Eppley Airport and the Comfort Inn and Embassy Suites; shuttles to/from these two hotels (only) and the Henry Doorly Zoo.

NOTE: Registration is limited due to available seating. Register early to avoid disappointment.

Registration fees payment by check or money order, payable to:
Omaha's Henry Doorly Zoo
Send in care of:
2002 Wildlife ART Symposium
Henry Doorly Zoo, 3701 South 10th Street
Omaha, Nebraska 68107-2200 USA

Registration fees can also be paid by credit card (Mastercard, Visa or Discover *only*); see: www.omahazoo.com to access the secured site for submitting credit card details.
For further instructions or more information, please write to: ARTSymposia@omahazoo.com
Please provide name, title and institutional affiliation (for name badges) as well as contact information (street address, telephone and fax numbers and e-mail address).
Registrants will receive written confirmation that their fees were received.

Hotel Information

Reservations should be made on your own. Use **"Wildlife ART Symposium"** as the group name to receive discounted rates until 30 August 2002 at both the Comfort Inn and Embassy Suites (*official venues where free shuttle service will only be available to and from Eppley Airport and the Henry Doorly Zoo*). A credit card is required to guarantee bookings.

Comfort Inn at the Zoo
2920 South 13th Court, Omaha, Nebraska 68108
Tel: +1 -402-342-8000; Fax: +1-402-342-8069
Toll free (in USA only): 1- 800 - 228 - 5150
For hotel details: www.comfortinn.com/hotel/ne049
Rate: US$ 55/night (single or double + breakfast)

Embassy Suites Old Market
555 South 10th Street, Omaha, Nebraska 68102
Tel: +1-402-346-9000; Fax: +1-402-346-4236
Toll free (in USA only): 1- 800- 362- 2779
For hotel details: www.embassyomaha.com/
Rate: US$ 119/night (single or double + breakfast)

The Second International Symposium on
Assisted Reproductive Technology (ART) for the Conservation
and Genetic Management of Wildlife
28-29 September 2002 (Saturday – Sunday)

Registration Form

Name:_____

Title:_____

Institution:_____

Postal Address:_____

_____

Telephone:_____

Fax:_____

E-mail:_____

Registration Fee: $200 per person (Includes final program; printed copy of proceedings; three coffee/tea breaks per day (early and mid-morning, afternoon); lunch on both days; cocktails (open beer and wine bar) on Friday, Saturday and Sunday evenings; dinner on Saturday evening; and hot hors d'oeuvres on Sunday evening; shuttles to/from Omaha's Eppley Airport and the Comfort Inn and Embassy Suites; shuttles to/from these two hotels (only) and the Henry Doorly Zoo).

Payable by: ☐ Check (Payable to Henry Doorly Zoo)

Credit Card: ☐ VISA, ☐ Mastercard or ☐ Discover *only*

Name as it appears on card:_____

Card Number:_____

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