



POST-SYMPOSIUM REPORT

INTRODUCTION

On July 22-24, 2018, approximately 150 delegates from 13 countries spanning five continents convened in Boston, Massachusetts, for the Alliance for Contraception in Cats & Dogs (ACC&D)'s 6th International Symposium on Non-Surgical Contraceptive Methods of Pet Population Control. ACC&D's driving inspiration is "innovation to save lives," and our symposia embody this concept in session content, networking among diverse audiences, and support for the next generation of scholars to engage in this field.

ACC&D strives to be a catalyst for advancing non-surgical options for humane and effective population control across the globe. We believe that making proceedings available free of charge is key to this goal. Below you will find a recap of the Symposium and its sessions. In addition, you can access recorded presentations and PowerPoints, as well as a [speaker list](#), through our [Symposium website](#). We encourage you to use this report as a resource and guide to the online options that are of interest and value to you.

Most of all, whether or not you've attended past symposia, we encourage you to join us in person at our 7th International Symposium! Online proceedings convey the information presented, but they cannot replace the extraordinary networking opportunities, frank discussions about challenges and lessons learned, and collaborations that are built when 150+ talented, motivated individuals come together in one place. As one participant stated:

If all it took was "where there's a will, there's a way," this group of people would be wildly successful. But as one person noted, "it's just too bad that reproduction is so hard to stop." That said, many seeds were sown and working relationships created and solidified.

This year's symposium captured the interesting and exciting advances and learnings in this field. Doors have closed on some technologies and approaches, but at the same time we are looking at gene transfer technology with anticipation and enthusiasm. Not only does this approach show positive preliminary results, but it is also becoming increasingly mainstream thanks to the advances being made in gene therapy in human medicine. Attendees repeatedly noted enthusiasm for Dr. David Pepin's research. Affiliated with Harvard Medical School, his Michelson Foundation-funded work in this area holds high promise, with a second pilot study in cats about to begin.

Additional talks often-recognized by audience members were the role that surgical sterilization might have on dogs' health. Dr. Michelle Kutzler shared research on the relationship between surgical sterilization, luteinizing hormone levels, and some diseases; additional knowledge and technology may help us improve the health of surgically sterilized dogs as we look for alternatives to surgery. ACC&D's work on marking and identification of free-roaming animals who have been non-surgically sterilized (non-surgical fertility control's value is largely dependent on knowing that it has been used!) and thoughtful assessments of learnings from using non-surgical fertility control in field settings were also commonly noted. So, too, were presentations on modeling of dog and free-roaming cat population

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management, with relevance now for surgical TNR as well as future permanent and multi-year contraceptives. Dr. John Boone shared data to help guide the field on the required duration of temporary contraceptives to allow them to fare well against permanent sterilization in free-roaming animals.

Post-Symposium survey ratings were high. Participants rated the overall conference an average of 4.76/5 (the best possible rating). Over 75% of respondents ranked the Symposium as a “5”; all others ranked it a “4.” Participants also offered particularly high ratings for the conference being educational, offering great networking, and having quality speakers.

PROCEEDINGS SUMMARY

The symposium devoted 1.5 days to general sessions, which convened all delegates for presentations and lively discussion on topics of relevance to advancing non-surgical fertility control for companion animals. Sessions covered regulatory considerations; needs and opportunities for non-surgical fertility control; in-depth analysis of a non-surgical option that has thrived, and one that has not; discussion of the risk/benefit profile of surgical sterilization; and a glimpse into the past, present, and future of the \$75 million Michelson Prize & Grants Program.

The final day divided attendees between a contraceptive science track and a field science and implementation track. The contraceptive science track focused on fertility control research—that which has been conducted, and that underway—as well as best practices and lessons learned for contraceptive research in laboratory and clinical contexts, and ethical considerations for research with owned animals. Meanwhile, the field science track covered a wide range of topics related to “real-world” applications of non-surgical fertility control. These included lessons learned from conducting contraceptive and other research in field environments, computer-based modeling to improve population management interventions, ethical considerations for conducting research in field contexts, methods for marking and identifying free-roaming animals who have been sterilized without surgery, and a look at the future of intratesticular injected fertility control options.

PARTICIPANTS

Past symposia have drawn attendees from a wide range of countries and backgrounds, and this one was no different. Attendees gathered from 13 countries and 30 U.S. states. Affiliations were equally diverse, with similar proportions of attendees representing animal welfare professionals, scientists, researchers, and veterinary professionals. Animal health and pharmaceutical professionals, and foundation representatives and investors were also represented, as were a substantial number of veterinary and PhD students. The diversity of participants, and the truly unique networking and opportunities for thought that this opens up, was consistently noted in post-Symposium survey responses.

SESSION HIGHLIGHTS

Contraceptive science: what’s been studied, what research is currently underway

The conference showcased a range of contraceptive research categories.



Gene transfer/vectored contraception

Speakers: Kevin Morris, PhD (moderator); Thomas Conlon, PhD; Ricki Lewis, PhD; David Pepin, PhD; Lindsey Vansandt, DVM, PhD

Gene delivery for single shot sterility was the star of the show as a promising new approach to safe, permanent sterilization of cats and dogs with a single treatment. Research using this approach has benefitted from extensive human gene therapy studies—and successes!—that have saved the lives of people with rare gene defects. Ricki Lewis, a science journalist and PhD geneticist, delivered the Symposium’s keynote address and introduced the audience to the “central dogma” of introducing genes that influence a particular reproductive pathway to suppress fertility in dogs or cats. She shared stories of how dogs born with rare genetic defects like myotubular myopathy, or “wasting puppy syndrome,” have been treated with gene therapy, replacing the missing or defective gene, and in doing so have served as a model for similar conditions in children. How does this relate to non-surgical fertility control? Gene delivery can cause the lifetime expression of a particular protein that may block reproduction.

Researchers presented two studies underway in cats using viral vectors to deliver genes to suppress fertility. In one pilot study, a viral vector carrying the gene encoding the hormone Mullerian Inhibiting Substance (MIS), which interferes with egg development, was administered to three cats with a single intramuscular injection. This viral vector technology has been used in human gene therapy for many years, but the delivery of the MIS gene is novel. Plans are underway for a second pilot study with an improved version of the feline gene.

Another researcher has used a viral vector to introduce a gene coding for a monoclonal antibody against GnRH in three female cats with a single injection.

Both methods have been shown to suppress reproduction in mice for over a year, their reproductive lifespan. In the cat studies, additional work is needed to determine dose, but initial results are promising, and have not resulted in safety issues, albeit in a very small sample of cats.

GnRH vaccines

Speakers: Joanne Maki, DVM, PhD (moderator); Maxence Dellacherie, PhD candidate; Shiri Novak, DVM/PhD candidate; Tal Raz, DVM, PhD

The GnRH vaccines session took participants on a tour through research related to suppressing gonadotropin-releasing hormone, sometimes called the “master hormone” because it regulates sex hormones and reproduction in both male and females.

Three presentations focused on GonaCon, a GnRH vaccine developed by the USDA’s National Wildlife Research Center and approved for suppression of fertility in white-tailed deer and wild horses. The vaccine had been tested in laboratory cats and shown to suppress reproduction in some cats for several years. ACC&D completed a study of a version of GonaCon in a group of cats kept in a facility that was



more “real world” than the laboratory studies. In addition, researchers in Israel studied Gonacon in feral cats in Israeli cities. Overall and disappointingly, results from this research to date has not been promising enough for ACC&D to advocate further development of Gonacon for control of feral cats.

A fourth presentation spoke to a novel approach to GnRH vaccination. Recognizing that it has been challenging to elicit a potent and long-lasting response to GnRH vaccines, a Michelson Prize & Grants-funded study has used an injectable mesoporous silica rods (MSRs) biomaterial platform to elicit anti-GnRH antibodies and potentially a cell mediated immune response. Although an immune response was seen, a single injection could not cause sufficiently long immunity for reproductive suppression.

Intratesticular injections

Speakers: G. Robert Weedon, DVM, MPP (moderator); Linda Brent, PhD; Raffaella Leoci, DVM, PhD; Marcela Pineda, DMV

The intratesticular injections session focused on zinc gluconate (Zeuterin[®]) and calcium chloride, used as sterilants in male dogs. Speakers discussed the mechanism of action and research into different injection techniques, their different trajectories in the marketplace (one an FDA-approved product, the other a compounded formula), and the results of a project using calcium chloride to sterilize male dogs in a rural community in Ecuador. Challenges, strengths, and limitations of each product—ranging from training veterinarians, to adverse reactions, to cost and accessibility—were addressed.

Other approaches

Speakers: Sandra Ayres, DVM, MS; Cristina Gobello, DVM, PhD

This session focused on two areas of research on non-surgical fertility control that were “outside the box” of other Symposium sessions.

Dr. Ayres’s works focused on targeting gonadal support cells, specifically using an antibody to guide a nanoparticle carrying a cytotoxin (“nanocomplex”) to specific cells found in the gonads (testes and ovaries). These cells are necessary for germ cells to develop and survive; the researchers hypothesize that destroying them using the nanocomplex will lead to sterilization. Preliminary data in a small, short-term pilot study suggests that this approach could safely suppress reproduction and further research is needed to understand the extent of suppression and the safety of the approach.

Dr. Gobello presented data from a long-term study in male and female dogs in which she administered a deslorelin implant (Suprelorin[®]) in the first 24 hours after birth in puppies. The hypothesis was that interfering with the post-natal rise in GnRH could potentially cause lifetime suppression of reproduction. The results showed that this post-natal treatment with a potent GnRH agonist caused a significant delay (up to two years) of puberty, but that all treated dogs developed normal reproductive capacity. It is clear that this method can delay puberty, but will not be useful in lifetime suppression of fertility.

Lessons learned, developing best practices

The field of non-surgical fertility has experienced both tremendous successes and significant



disappointments—and through both, it has accumulated a number of lessons learned and best practices. These were brought to the table in three sessions.

Market acceptance and success of non-surgical products

Speakers: Cathy Moldave, MBA; Marie-Paul Lachaud, DVM

This session delved into the trajectories of zinc gluconate (Zeuterin[®]), an intratesticular sterilant for male dogs approved by the FDA, and Suprelorin[®], a contraceptive implant that suppresses fertility for 6 or 12 months (depending on implant size) in male dogs. Suprelorin is approved in the European Union, Australia, and New Zealand. Suprelorin has found a large market and is well accepted, and Zeuterin is no longer on the market.

The talk presented information from discussions with European veterinarians, as well as interviews with over a dozen individuals closely involved with Zeuterin development and marketing, to identify information and opinions that might inform strategies for the introduction and marketing of future non-surgical products to help them succeed. Particular attention was given to market considerations and the drivers of market acceptance, including the two arguably very different markets—“private” (e.g., individual pet owners, corporate entities, academic veterinary hospitals and clinics) and “nonprofit” (e.g., shelters, municipalities, animal welfare organizations)—to which non-surgical veterinary pharmaceuticals must appeal. The ultimate question: Is it possible to serve the nonprofit *and* for-profit sectors, and what are the key attributes that will drive success?

Lesson learned: field studies

Speakers: Elly Hiby, PhD (Moderator); Valerie Benka, MS, MPP; Emma Clifford; Amy Fischer, PhD; Stephanie Boyles Griffin, MS; Giovanna Massei, PhD; Andrew Rowan, PhD;

This session convened six experienced field practitioners who have used either non-surgical fertility control in dogs, cats, or wildlife, or have managed related interventions whose lessons can be applied to future work with non-surgical options. Their experience spans five continents and many countries.

The speakers opened the session by picking top lessons from their field work, followed by an animated Q&A filled with abundant—and often comical—anecdotes and thoughtful insights on topics including stakeholder analysis and engagement, the importance of both a supportive veterinary team *and* support staff/volunteers, the need for clear protocols for the intervention itself and unexpected adverse events, and the importance of prioritizing ethical decision-making as part of an intervention.

Contraceptive research and regulation

Contraceptive research: A laboratory and clinical perspective

Speakers: Cheri Asa, PhD (Moderator); Amy Fischer, PhD; Linda Rhodes, VMD, PhD; Andrew Rowan, PhD; Lindsey Vansandt, DVM, PhD

“Contraceptive research: A laboratory and clinical perspective,” was a companion to the field studies



session, its focus being lessons learned and best practices from the stages *before* a non-surgical product or technology is introduced to the field. Speakers represented a cross-section of laboratory researchers, animal welfare professionals, and regulatory experts.

Speakers covered a range of topics, including strategies for enrichment and preparing study subjects for adoptive homes; the opportunities and limitations of a novel hybrid laboratory/field research model; working with institutions established to oversee animal research; and specific challenges of conducting contraception gene delivery studies, particularly when the goal is to adopt animals out at the study's end. The differences between academic research and clinical research for regulatory submission were also addressed in depth, including considerations for study design, long-term trials, and the roles of sponsors, veterinarians, and pet owners.

Regulation of contraceptives

Speaker: David Petrick, VMD, JD

The regulatory approval of non-surgical contraceptives (temporary) and sterilants (permanent) is required in order to bring a product to market. Regulatory approval requires that a pharmaceutical or vaccine has data to prove its label claim, has been shown to be safe in the animals in which it will be used, and most importantly, has demonstrated that it can be manufactured in a reproducible and quality manner. These requirements for very high quality data and manufacturing are expensive and take many years to achieve.

Dr. Petrick, with extensive experience as a regulatory consultant who has brought many novel animal health products to the marketplace, described the components of veterinary drug development (agencies, technical considerations, chemistry, manufacturing, controls, target animal safety and efficacy, and environmental safety) with comparisons between the United States and European Union.

Assessing the risk/benefit profile of surgical sterilization: epidemiological and laboratory approaches

Speakers: Gary Patronek, VMD, PhD (Moderator); Michelle Kutzler, DVM, PhD; Margaret Slater, DVM, PhD

This session addressed the risk/benefit profile of surgical sterilization of dogs and cats, drawing from both epidemiological and laboratory data.

The session began with veterinary epidemiologist Dr. Slater's review of existing research that addresses the question: "How does spaying or castrating a dog (exposure) cause some defined outcome?" Outcomes that may be affected by spaying or castrating dogs, such as behavior and health effects, were discussed. Although there are several studies on the relationship between sterilization and various health and behavioral outcomes in dogs and a few in cats, the key take-away is that the physical and behavioral effects of sterilization on an animal are complex and context-specific, making it difficult to generalize, and that the studies to date have been limited, with data often being breed-specific.

The session then turned to Dr. Kutzler's laboratory research evaluating the effect of surgical sterilization



on dogs' production of luteinizing hormone (LH). LH levels in surgically sterilized dogs have been shown to be elevated, due to lack of negative feedback of gonadally produced estrogen or testosterone. Dr. Kutzler presented her research where using immunohistochemistry, she identified LH receptors in a variety of non-reproductive tissues. She hypothesized that the higher incidence of problems such as urinary incontinence, lymphosarcoma, and hip dysplasia that have been described in surgically sterilized dogs might be related to elevated LH acting on receptors in these tissues. This provocative hypothesis was discussed, and epidemiologists pointed out that a correlation does not prove causation and significant additional research is needed.

The takeaway message of both talks in the session was that surgical sterilization has benefits for both individuals and populations of animals, but like any medical intervention has a risk/benefit ratio. Additional research will help make better-informed decisions and alternatives for fertility control may provide choice based on the needs of individual animals.

The need and opportunities for non-surgical tools for fertility control

Speakers: Joyce Briggs, MS (Moderator); Kate Atema, MS; Roger Haston, PhD; Andy Sparkes, BVetMed, PhD

This session convened experts on dogs and cats; pet, community, and free-roaming populations; and a variety of nations across the globe to discuss the need and opportunities for non-surgical technologies. The speakers took a nuanced look at the landscape of dog and cat populations, and the humans with which they are closely connected, to provide often-unexpected ideas for ways that non-surgical—as well as surgical—sterilization can best serve different populations. A thread that ran through the talks was that *merely* increasing volume of spay/neuter is neither a need nor a solution. A more flexible model that can better respond to specific community and pet owner circumstances and desires will offer much greater value and impact, and non-surgical options could be a key asset to this flexible model.

The Michelson Prize & Grants: past, present and future

Speakers: Thomas Conlon, PhD; Linda Rhodes, VMD, PhD

For a concise discussion of major research in non-surgical fertility control and what it's taught us over the past decade, you'll want to view this talk!

The mission of Michelson Found Animals is to eliminate the euthanasia of healthy, adoptable companion animals and to reduce populations of feral and free-roaming cats and dogs. Among its forward-thinking initiatives is the Michelson Prize and Grants Program (MP&G), which consists of a \$25 million prize for a permanent, single-dose, nonsurgical sterilant for male and female dogs and cats, and \$50 million in grant funding for promising research in pursuit of a sterilant with this profile. To date, the program has committed over \$15 million for 37 projects and attracted world-class researchers from both human and animal health. It has also committed to bring promising research through the regulatory process and to market, intending to ensure that shelters and lower-income pet owners can access the product.



This session detailed what has been learned from MP&G funded research over ten years in immunocontraception; contraception through targeting specific areas of the brain as well as the pituitary gland and gonads; use of the GnRH agonist deslorelin; and a variety of novel approaches, specifying what did not work with specific research projects—and by extension, where the field can “close doors” and reallocate funds and focus. A key focus of MP&G moving forward is gene delivery, an approach that offers potential of a single-shot lifetime effectiveness, and could benefit from significant progress currently underway in human medicine.

Marking and identification

Speakers: Valerie Benka, MS, MPP; Susan Getty, MS

Imagine that we have the perfect non-surgical sterilant (permanent), or contraceptive (multi-year, but requiring retreatment), with the potential to easily, humanely, and effectively prevent unwanted litters in free-roaming dogs and cats—all without anesthesia. It’s ACC&D’s dream! And yet, there’s currently no method to reliably mark these animals as having been treated. Ear tipping/notching is not humane in conscious animals, nor are traditional tattoos, and collars are not reliable.

ACC&D has been working to identify a means to identify animals. This presentation discussed the work that’s been done to date, beginning with a Think Tank convening a diverse group of experts; moving to research, development, and trials with a novel ear tag; and ending with a new and promising “needleless tattoo” technology involving both colored and UV-reflective ink. Work going forward will seek to move both an improved ear tag and needleless tattoo into pilots in the field.

Modeling and monitoring companion animal populations

Speakers: Jessica Beckstrom, DVM candidate; John Boone, PhD; Luz Maria Kisiel, MS

This session took a step away from non-surgical fertility control *per se* and focused on three individual-based stochastic simulation models. Computer simulation models are a powerful tool to enhance our understanding of how to most effectively use and optimize limited resources to manage dog and cat populations. Increasing our sophistication in deploying current tools will help the field in using future non-surgical options that have varied effectiveness and cost profiles.

One presentation (Kisiel) evaluated the effect of surgical sterilization on owned dog population size in a community in Mexico. It fed empirical data collected from the community and data in peer-reviewed literature into a computer simulation to evaluate the final population of animals after 20 years with four different surgical sterilization interventions. The conclusion: In this particular context, surgical sterilization directed at sexually immature female dogs could most effectively reduce the owned dog population over time.

The other two presentations drew from individual-based stochastic simulation models of free-roaming cat populations. One (Beckstrom) evaluated the impact of variations on traditional surgical sterilization methods – namely vasectomy and hysterectomy – on population size over time. Another (Boone) discussed ACC&D’s initiative to evaluate the necessary duration of efficacy for a long-term



contraceptive to have a comparable population impact as permanent sterilization, the outcomes and total costs of different population control approaches and intensities over 10 years, and key metrics for each of approximately 150 scenarios (numbers of kittens ever produced, surviving kittens, adults ever living in a colony, and premature deaths). Important take-aways include: the cost-benefit of TNR compares well to removal if it is concentrated, intensity and “front-loading” of an intervention is critical, an optimized contraceptive compares well to permanent sterilization, immigration of new cats (e.g., through abandonment) dramatically reduces the impact of sterilization or contraception, and, of critical import to humane efforts, using fertility control ineffectively at the population level helps individual cats but is much worse at reducing overall premature deaths within a population.

Ethical considerations for research and innovation involving owned and community animals

Speakers: Valerie Benka, MS, MPP; Joyce Briggs, MS; Lisa Moses, VMD, DACVIM, CVMA; Jesse Winters

Dogs and cats present some unique ethical considerations as subjects in research studies or other field-based interventions. Traditional ethical review bodies, as well as federal guidelines, tend to focus on considerations for using laboratory animals, rather than the broader considerations of research with pets and free-roaming owned animals—i.e., situations where people and communities, as well as animals, must be carefully considered.

In developing our own research studies outside a laboratory context, ACC&D observed these gaps in guidance and resources and saw an opportunity to begin filling them. This began with a Think Tank on “Ethical decision-making in innovation for animal welfare,” which led to projects that are currently underway to provide resources for those in the animal welfare and veterinary fields conducting research and projects with animals in community, clinical, or shelter settings.

The Symposium showcased preliminary outputs and next steps of these projects in two sessions, one geared toward field practitioners, and the other toward a more research science audience.

Awards

We were pleased to offer awards to both individuals who have had illustrative careers in this field, as well as those who have shown great promise as leaders of the next generation.

Andrew Rowan, PhD, received our Leadership Award. This was given with appreciation for Dr. Rowan’s strategic contributions to ACC&D and the field of non-surgical fertility control for dogs, cats, and wildlife over more than a decade. This includes his tenure on ACC&D’s Board of Directors and now Scientific Advisory Board, as well as his work on non-surgical fertility control at The HSUS and Humane Society International.

Cathy Moldave, MBA, received our Award of Appreciation for her similarly longstanding support and contributions to ACC&D, including but not limited to authoring multiple editions of ACC&D’s e-book *Contraception and Fertility Control in Dogs and Cats*, a definitive guide to non-surgical research and tools for companion animal species. This book continues to be [available](#) at no cost on ACC&D’s



website.

Thanks to the Kevin L. Brown Memorial Scholarship, ACC&D provided three graduate students with an all-expenses-paid trip to the Symposium. The three winners of this competitive application process were Julie Barns (US), Valerio Moccia (Italy), and Liat Morgan (Israel). All three have folded reproductive research into their academic work in various capacities and show great promise for leadership in advancing non-surgical fertility control. They were recognized as contest winners at the Symposium banquet dinner, and their biographies are available [here](#).

Poster Session

Presenting authors: Fernanda Argenton, DVM student; Peter Denooij, DVM; Sabrina Gust, Claire Kiefel, H.B.S.; Nihal Korkmaz, PhD; Michelle Anne Kutzler, DVM, PhD; Giovanna Massei, PhD; Valerio Moccia, MS; Liat Morgan, DVM/PhD candidate; Cristiane S. Paranzini, DVM, PhD candidate; Katherine Polak, DVM, PhD; Monica De los Reyes, DVM, PhD; Tal Raz, DVM, PhD; Tatiana Samoylova, PhD; and Julianna Thuróczy, PhD

The Symposium's Poster Session drew authors from Argentina, Brazil, Canada, Chile, Hungary, Israel, Italy, the UK, and the US. Posters reported on clinical studies and field research with non-surgical fertility control, as well as a range of initiatives on complimentary topics: expression of luteinizing hormone and related health implications following canine sterilization; associations between neutering and health/welfare; human attitudes and behaviors related to surgical and non-surgical fertility control; and more.

IN SUMMARY

With this summary report as a guide, we encourage you to take a deeper dive into the information and resources presented at the symposium. Speakers and poster authors have generously given permission to share their materials on the ACC&D website, and ACC&D makes these available at no cost in keeping with our commitment to education and outreach for all on the topic of non-surgical fertility control. The online symposium proceedings include research abstracts, PDFs of PowerPoint slides, and either video or voice-recorded presentations for nearly every speaker, as well as abstracts and PDFs for poster presentations.

We will let attendees speak for themselves regarding their experience at the Symposium!

ATTENDEES REFLECT ON THE SYMPOSIUM

This symposium once again united people from hard core science to out in the field. That breadth resulted in so many great presentations it was difficult to choose. I'm really excited about some of the upcoming possibilities for non-surgical contraception now! And I have a much better understanding of what some of the more promising options are and how they will be progressing.

- **Margaret Slater**, Senior Director, Research and Development, ASPCA



The ACC&D's 6th International Symposium was well organized, the atmosphere was very friendly and the academic and scientific relevancy was clear. Thank you all! I'm looking forward to the 7th symposium.

- **Tal Raz**, Reproductive biologist and theriogenologist, Koret School of Veterinary Medicine, The Hebrew University, Israel

The symposium was organized to make good use of every minute. The unique thing about ACC&D is that it integrates communities that otherwise have limited interaction - animal welfare, academic and industry science and leaders in reproductive biology.

- **Linda Rhodes**, Board member, ACC&D, Scientific Advisor, The Michelson Found Animals Foundation

I think the symposium was great in that it brought together people from very different backgrounds - field practitioners, population modelers and laboratory scientists - in a way that encouraged discussion and debate about what is needed to advance non-surgical fertility control options. I think this is very much in line with ACC&D's mandate as a catalyst organization.

- **Darryn Knobel**, Director, Center for Conservation Medicine and Ecosystem Health; Professor of Epidemiology and Population Health

As someone new to the field I found the symposium interesting, informative and enlightening. The range and credentials of the speakers was most impressive. I learned so much and met many interesting and passionate people. Well Done!

- **Rose Lombardo**, Communications Associate, Botstiber Institute for Wildlife Fertility Control

SPECIAL THANKS

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We also thank the members of our Review Committee for evaluating scientific abstracts for the Symposium the many ACC&D Board members, Scientific Advisors, and volunteers who contributed to ensuring a successful conference program!