

Conservation Science Alliance Work Outputs 2018-2020

CURRENT MEMBERS:

STAFF

Associate Prof. [Dalia A. Conde](#) Ph.D., Director of Science Species360, and [SDU](#)

Dr. [Johanna Staerk](#), Research Scientist and Post Doctoral fellow at SDU

Dr. [Rita da Silva](#), Research Scientist, Aquatics Coordinator and Post Doctoral fellow at SDU

Dr. Andrew Teare, Research Scientist

[Dr. Morgane Tidere](#), Research Scientist and Postdoctoral fellow at SDU will join us on the first of May 2020.

Training the next generation

GUEST STUDENTS Master program (2019-2020)

Rikke Nielsen, Master Student ([SDU](#))

Line Lindholm Sørensen, Master student ([SDU](#))

Simon Kaae Andersen, Master student ([SDU](#))

Guest Students PhD. Program

[Andrew Mooney](#), Ph.D. student, [Trinity College Dublin](#),

[Simeon Smeele](#), Ph.D. student [Max Planck Institute](#).

STAFF ONGOING PROJECTS (*not yet published*)

The evolutionary landscape of primate longevity, Alberts, S. Colchero, F. Conde, D.A, Staerk J, et al. *In prep. (Peer-review journal)*.

Description: Exploring patterns and evolutionary constraints of aging in humans and other primate species using datasets from 32 different studies of wild and captive nonhuman primates and humans.

The international commercial trade of live turtles and tortoises: exploring patterns and hotspots for legislative change. Rita da Silva, Fernando Colchero, Peter Paul van Dijke, Johanna Staerk, Chris R. Shepherd, Lionel Jouvet, Jordi Janssen, Dalia A. Conde*. Under Revision. (Journal of Biological Conservation).

Description: Identifying hotspots of potential laundering of wild turtles and tortoises as captive-bred to initiate legislative change based on data from International Trade in the last 40 years.

Da Silva, R., Conde, D.A. Colchero, F., **Mortality trajectories of turtles and tortoises in captivity**. *In prep. (Peer review journal)*.

Description: Studying mortality trajectories of captive individuals of turtles and tortoises from husbandry data.

Staerk J., Colchero F., Wilson K., Foden, W., Pereboom, Z., Martin, T., Flesness, N., Fa, J.E.,

Conde D.A. Supporting integrated conservation planning decisions of threatened species in the European Union. *In prep. (Peer-review journal).*

Description: Using decision analysis to decide whether captive breeding, habitat conservation, or both can be effective in advancing the conservation of threatened EU species currently held in zoos in the European Union.

PUBLICATIONS (Includes staff and guest students)

2020

[Sex differences in adult lifespan and aging rates of mortality across wild mammals](#), Jean-François Lemaître, Victor Ronget, Morgane Tidière, Dominique Allainé, Vérane Berger, Aurélie Cohas, Fernando Colchero, **Dalia A. Conde**, Michael Garratt, András Liker, Gabriel A. B. Marais, Alexander Scheuerlein, Tamás Székely, and Jean-Michel Gaillard, PNAS (2020)

[Open Science principles for accelerating trait-based science across the Tree of Life](#), Gallagher, RV., Falster, DS., Maitner, BS. ... **Conde, DA**, et al.(2020). Open Science principles for accelerating trait-based science across the Tree of Life. Nat Ecol Evol 4, 294–303

Mooney, A., Conde, D.A., Healy, K. *et al.* (2020) [A system wide approach to managing zoo collections for visitor attendance and in situ conservation](#). *Nat Commun* **11**, 584.

Description: Assessment of global patterns in zoo visitor attendance in relation to institutional species composition, and how these relate to key conservation outcomes such as institutional in situ project investment.

2019

Conde, D. A. et al. (2019). [Data gaps and opportunities for comparative and conservation biology](#). PNAS first published April 19, 2019, <https://doi.org/10.1073/pnas.1816367116>

Description: We develop a Demographic Species Knowledge Index that classifies the demographic information for the world's tetrapod species. We found comprehensive information on birth and survival for less than 2% of the species, and show the major potential of zoos and aquariums to significantly increase our demographic knowledge. Press release Species360: [here](#)

Challender, D. W.S., Hoffmann M., Hoffmann R., Scott J., Robinson J. E., Cremona P., Hilton-Taylor C., Jenkins R. K. B., Malsch K., **Conde, D.** and Tom De Meulenaer (2019) [Criteria for CITES species protection](#), *Science*, vol 364, issue 3467, April 19. pp 247-248

Description: Response letter to [Frank & Wilcove \(2019\)](#)

Ilieva, I., Juvet, L., Seidelin, L., Best, B. D., Aldabet, S., **da Silva, A. R., & Conde, D. A.** (2019). [A global database of intentionally deployed wrecks to serve as artificial reefs](#). *Data in Brief*, 23. <https://doi.org/10.1016/j.dib.2018.12.023>

Description: A database of geo-referenced, intentionally deployed wrecks that can serve as artificial reefs. Data reported include data on the type of structure, location, depth, country,

year of deployment and estimated life span of the wreck, location inside one of the Worlds Protected Areas, key biophysical Standard Level Data from the World Ocean Database, distance to reefs from the Coral Trait Database, and distances to 597 aquariums that are members of the Species360 global network.

Press release Species360: [here](#)

Da Silva, R., Pearce-Kelly, P., Zimmerman, B., Knott, M., Foden, W., & **Conde, D. A.** (2019). [Assessing the conservation potential of fish and corals in aquariums globally](#). *Journal for Nature Conservation*, 48, 1-11. doi.org/10.1016/j.jnc.2018.12.001
Description: Assessment of the number of fish and Anthozoa (coral and anemone species) registered in ZIMS aquariums. We highlight the number of species that are listed on the IUCN Red List of threatened species, are vulnerable to climate change, Evolutionary Distinct and Globally Endangered (EDGE), and listed by the Alliance for Zero Extinction (AZE).
<https://www.species360.org/serving-conservation/aquarium-coral-conservation-2019-2/>

Da Silva, R., & Conde, D. A. (2019). **Data on the conservation potential of fish and coral populations in aquariums**. *Data in Brief*, 22, 987-991. <https://doi.org/10.1016/j.dib.2018.12.083>
Description: Data paper related to above publication.
<https://www.species360.org/serving-conservation/open-data-2/>

Staerk, J., Conde, D. A., Ronget, V., Lemaitre, J. F., Gaillard, J. M., & Colchero, F. (2019). **Performance of generation time approximations for extinction risk assessments**. *Journal of Applied Ecology*. <https://doi.org/10.1111/1365-2664.13368>
Description: Generation time is an essential component of IUCN Red List assessments. In this paper we assess errors in the prediction of species generation time in seven different measures of generation time. We show that these errors can lead to an underestimation of the extinction risk of threatened species and propose a new way of calculation generation time based on readily available life history data.
Press Release SDU: [here](#)
Press Release Species360 [here](#)
Other Press Releases: [The Conversation](#)

Colchero, F., Jones, O. R., **Conde, D. A.,** Hodgson, D., Zajitschek, F., Schmidt, B. R., ... Gaillard, J-M. (2019). [The diversity of population responses to environmental change](#). *Ecology Letters*, 22(2), 342-353. <https://doi.org/10.1111/ele.13195>
Description: Explores how the age-dependency in demographic rates and the year-to-year interactions between survival and fecundity affect stochastic population growth rates. Shows that oversimplification in models may lead to predicting a species to thrive while it may, in reality, go extinct.
Press-Release SDU: [here](#)

2018

Staerk, J., Conde, D. A. Siriaronat, B., Ryder, O., Hvilson, C. (2018). [Saving samples, saving species: Biobanking is essential for genetic rescue and population management sustainability](#). *Zooquaria*, 101.

Description: Describes the importance of biobanking live cells, the EAZA biobank and the potential of ZIMS data to support genetic rescue.

Mooney A., Conde D. A., Healy, K., Teare, A. & Buckley, Y. M. 2018. [ZIMS and flamingo management: Moving from Data to Decisions](#). *Flamingo*, e1: 76-80.

Description: Investigates the relationship between flock size and reproductive success of flamingos within zoo and aquarium collections.

Staerk, J. da Silva, A. R., Jouvét, L. & Conde, D. A.,(2018). [CITES Animals Committee Doc. 13.1 Annex 3](#).

Description: Supporting CITES in reviewing the breeding biology and captive husbandry of sixteen species presented at the 30th meeting of the Animals Committee.

Staerk, J., & Conde, D. A. (2018). [CITES SC70, Doc. 51, Annex 2 \(Rev.1\). Review of facilities keeping Asian big cats in captivity](#).

Description: Supporting CITES in their decision 17.229 a) on reviewing facilities keeping Asian big cats in captivity. Development of a database and a summary report on the number of cats and facilities keeping those cats presented at the 70th meeting of the Standing Committee.

Staerk, J., da Silva, R., et al. & Conde, D.A.(2018). [Manual for the differentiation of captive-produced and wild-caught turtles and tortoises](#). (17.291 a)

Description: Supporting CITES in their decision 17.291 a) ii) on developing guidance concerning the differentiation of specimens of tortoises and freshwater turtles (Testudines spp.) originating from the wild, from those from captive or ranching production systems. Development of a guide for customs officials and inspectors.

Featured in

EU forum

European Habitats Forum (2019). **The implementation of the EU 2020 Biodiversity Strategy and recommendations for the post-2020 Biodiversity Strategy** (Opinion statement from International and European NGOs recommends the EU to support the Species Knowledge Index, page 5). [Link](#)

In open access textbook (p. 412)

Wilson, J. W., Primack, R. B. (2019) "Conservation Biology in Sub-Saharan Africa". Cambridge, UK: Open Book Publishers, 2019, <https://doi.org/10.11647/OBP.0177>
Download book: [here](#)

WORKSHOPS

2020

Pfau B., ... **Staerk, J., da Silva R., Andersen S.**, Kwet, A., Monzel, M. International [Cooperation on Species Protection with special focus on turtles and tortoises](#) ("Frankfurt Talks"), 31st of January, 2020, Senckenberg Natural History Museum, Frankfurt, Germany.
Organizers: German Association for Herpetology and Terraristic
Description: Exploring potential synergies between Species360, DGHT, and other organizations involved in projects related to the wildlife trade of turtles and tortoises.

2019

Colchero, F.,..., **Conde, D.A., Staerk, J., da Silva**, Smeele S., etal. Exploring the landscape of Sex Differences on Survival of Animals Under Human Care. University of Southern Denmark, Marine Laboratory, Kerteminde, Denmark.
Organizers: CPop Nat (IMADA and Biology Departments), CPop Kernel, University of Southern Denmark and Species360.

2018

Colchero, F.,..., **Conde, D.A., Staerk, J.**, Alberts, S. **The evolutionary landscape of primate longevity**. Duke University, Durham, USA.
Description: Understanding the rate of aging by comparison of life expectancy and lifespan equality investigating 32 primate populations from the wild and in captivity in collaboration with Duke University.
This project is being led by the [Primate Life Histories Working Group](#) and the Species360 Conservation Science Alliance is a collaborator on this project together with Zjef Pereboom from the [Royal Zoological Society of Antwerp](#)

Staerk, J., da Silva, R., Conde, D.A. Shepherd, C.R. [Investigating patterns of international wildlife trade in ASAP species](#), Conservation Planning Specialist Group, 2018 Annual meeting. Available [here](#) (page 8).

TALKS (Includes staff and guest students)

2020**Mooney, A. (Invited Speaker), Presentation: Species360 Conservation Science Alliance Research**

BIAZA Regional Education Committee Meeting, 28th February 2020 Group Annual Meeting, 7th-8th October 2019, Galway Atlantaquaria, Ireland
Galway Atlantaquaria, National Aquarium of Ireland, February 28th 2020, Galway, Ireland

Conde, DA. (Invited speaker), “Species360 Conservation Science Alliance”. Workshop of the German Association for Herpetology and Terraristic (DGHT) on Species Protection with special focus on turtles and tortoises (“Frankfurt Talks”), 31st of January, 2020, Senckenberg Natural History Museum, Frankfurt, Germany.

Staerk, J. (Invited speaker), “The Species360 ZIMS database” and “Compiling the „Manual for the differentiation of captive-produced and wild-caught turtles and tortoises (Testudines)“ for the CITES Secretariat”. Workshop of the German Association for Herpetology and Terraristic (DGHT) on Species Protection with special focus on turtles and tortoises (“Frankfurt Talks”), 31st of January, 2020, Senckenberg Natural History Museum, Frankfurt, Germany.

da Silva, R. (Invited speaker), “Analysis of international trade of turtles and tortoises / Mortality trajectories of turtles and tortoises with ZIMS data”. Workshop of the German Association for Herpetology and Terraristic (DGHT) on species Protection with special focus on turtles and tortoises (“Frankfurt Talks”), 31st of January, 2020, Senckenberg Natural History Museum, Frankfurt, Germany.

Kaae Andersen, S. (Invited speaker), “Economic aspects of turtle farming and trade in Indonesia and Malaysia (first results of the Trade Chain Turtle project)”. Workshop of the German Association for Herpetology and Terraristic (DGHT) on Species Protection with special focus on turtles and tortoises (“Frankfurt Talks”), 31st of January, 2020, Senckenberg Natural History Museum, Frankfurt, Germany.

2019

Mooney, A., Zoos: Does Size Matter?, British Ecological Society (BES) Annual Meeting, 11th - 13th December 2019, Belfast, Northern Ireland.

Nielsen, R.: The world’s aquariums key role to support shark conservation, European Union of Aquarium Curators Conference (EUAC) 2019, 14-18 of October 2019, Bologne, France.

Conde DA. CITES, 18th Conference of the Parties (CoP18), Geneva,

Conde DA. CITES, 18th Conference of the Parties(CoP18), Geneva,

We thank our guest student for the following talks: Mooney, A., Presentation: Species360 Conservation Science Alliance Research

BIAZA Records Group Annual Meeting, 7th-8th October 2019, Longleat Safari Park, UK
Chicago Zoological Society, 11th July 2019, Brookfield Zoo, Chicago, Illinois.
Lincoln Park Zoo, 9th July 2019, Chicago, USA.
San Diego Zoo Global Board and Conservation Council, 13th June 2019, San Diego, USA.
Los Angeles Zoo and Botanical Gardens, 12th June 2019, Los Angeles, USA.
Wildlife Conservation Society, 6th June 2019, Bronx Zoo, New York, USA.
San Diego Zoo Global, 21st May 2019, San Diego Zoo Safari Park, USA.
SeaWorld San Diego, 21st May 2019, San Diego, USA.
EAZA Directors' Day, 23rd – 25th April 2019, Jersey Zoo, St. Helier, Jersey, UK
Birch Aquarium, Scripps Institution of Oceanography, 9th April 2019, La Jolla, California, USA.
Aquarium of the Pacific, 21st March 2019, Long Beach, USA.
Shark Reef Aquarium at Mandalay Bay, 5th March 2019, Las Vegas, USA.
Dublin Zoo, 14th January 2019, Dublin, Ireland.

Mooney, A., Zoos: Does Size Matter?, 2nd Irish Ecological Association Conference, 10th-12th January 2019, National University of Ireland, Galway.
Conference program: [here](#)

2018

Mooney, A. (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, Chester Zoo, 19th November 2018, Chester, UK.

Conde, D.A (Key note) **Decision analysis and decision quality for Species Conservation**, IX National Congress of Scientific Research in Parks (IX Convegno Nazionale della Ricerca nei Parchi: Conoscere per Proteggere). Verona, Italy, October 5th -8th [Conference program](#)

Staerk, J. (Plenary) **Innovative tools and methods in species conservation**, in collaboration with the Species Conservation Toolkit Initiative, IUCN Conservation Planning Specialist Group (CPSG), October 18-21st, Bangkok, Thailand. [Conference Program](#)

Da Silva A. R. (Speaker) **Can Aquariums save corals?** European Union of Aquarium Curators, Hull, UK. Conference Program (see page 20), [description](#)

Conde, D.A. (Speaker) **Genetic Rescue as insurance of genetic variability**, World Association of Zoos and Aquariums, Bangkok Thailand, October 21- 28th

Conde, D.A. (Keynote) [Mapping Species Knowledge– the value of data and digital infrastructure to address the extinction crisis](#), Digital Infrastructures for Research (DI4R) conference, Lisboa, Portugal.

Conde, D.A. (Seminar invited speaker) [Mapping information gaps: towards and index of knowledge for every vertebrate species](#), Seminar, University of Oxford,

Da Silva, A.R. (Speaker), Colchero, F., Conde, D.A. **Do Turtles Senesce Under Human Care?**
Evolutionary Demography Society, Lyon, France.

[Link to conference program \(pdf\).](#)

Mooney, A. **Zoos: Does Size Matter?**, World Association of Zoos and Aquariums, Bangkok
Thailand, October 21- 28th.

[Link to presentation \(pdf\)](#)

ONGOING

Mooney, A., Teare, A., Buckley Y.M. Staerk J, Simeon S, et al. . How does flock size and structure influence reproductive success in captive Flamingos?. *In prep. (Peer review journal).*

Description: Development of species-specific management guidelines for ex situ flamingo populations in collaboration with the IUCN SSC Flamingo Specialist Group and the TAG chairs from EAZA and AZA

Mooney, A., Staerk, J., Ryder, O., Buckley Y.M. Conde, D.A. Setting priorities for the banking of cell tissues for genetic rescue across Zoos and Aquariums. *In prep. (Peer review journal).*

Description: Development of a prioritization protocol for the collection of genetic samples from endangered species to be banked in cryogenic storage facilities.

Andersen, S. Staerk, J., da Silva, R, Conde, D.A. **Wildlife laundering of freshwater turtles via trade chain analysis**, Master thesis, University of Southern Denmark, Odense, Denmark with Species360 Conservation Science Alliance, [Wildlife Reserves of Singapore](#), [TRAFFIC](#), Monitor and [DGHT](#).

Sørensen, L., Conde, D.A.: **Prioritizing ASAP species for genetic rescue**, Master thesis, University of Southern Denmark, Odense, Denmark with Species360 Conservation Science Alliance, and [IUCN ASAP](#).

Description: Development of a decision analysis framework to prioritize ASAP species in need for genetic rescue and cryobanking of cell samples.

Nielsen, R., Staerk, J. & da Silva R., Knott M. & Conde, D.A. **Zoos and aquariums through the lens of CITES: Opportunities for zoos and aquariums to support Elasmobranch species threatened by international trade**, Nielsen, R., Master thesis, University of Southern Denmark, Odense, Denmark. with Species360 Conservation Science Alliance, [CPop SDU](#) and [ZIMS for Aquariums Product Owner](#).

Description: Investigation of life expectancy patterns of Elasmobranchii species using ZIMS data

Silva. D.A. **Demographic data analyses enhance biodiversity conservation and sustainable international trade in fish, corals, turtles and tortoises**, Ph.D. thesis, University of Southern Denmark, Odense, Denmark. Supervisors Dalia A. Conde and [Fernando Colchero](#)

Mooney, A. **Linking in-situ and ex-situ wildlife conservation efforts to enhance global wildlife conservation**, Ph.D. thesis, Trinity College, Dublin, Ireland. Supervisors: [Yvonne Buckley](#) and Dalia A. Conde,

2019

Frederiksen, C., **Staerk, J.**, Lindahl-Jacobsen, R. **Conde, D.A.:** **Male-female differences in Felidae species**, Student project, [European Doctoral School of Demography](#), University of Southern Denmark, Odense, Denmark.

Description: Understanding patterns in male-female survival differences in cat species using birth and death records from ZIMS. Project in collaboration with the Species360 Conservation Science Alliance, [CPop SDU](#) and the University of Lyon.

Nielsen, R., Staerk, J. & da Silva R., Knott M. & Conde, D.A. **Zoos through the lens of CITES: Opportunities for zoos and aquariums to support species threatened by international trade: A case study for Elasmobranchii**, Nielsen, R., Student project, University of Southern Denmark, Odense, Denmark. with Species360 Conservation Science Alliance, [CPop SDU](#) and [ZIMS for Aquariums Product Owner](#).

Description: Investigating the numbers of Elasmobranchii species in ZIMS and the CITES Trade database as well as a review of legislation to understand how legislative changes may affect captive populations.

Sørensen, L., **Staerk, J.**, **Conde, D.A.:** **Prioritizing conservation actions for ASAP species**, Student project, University of Southern Denmark, Odense, Denmark.

Description: Development of a prioritization protocol for species in the IUCN Asian Species Action Partnership and doing a literature review on the number of action plans in place. Student Project of Sørensen, L., in collaboration with the Species360 Conservation Science Alliance. [CPop SDU](#) and the IUCN Specialist Group ASAP

Staerk, J. (Invited lecturer), **Demography in the Anthropocene: Applying Population Dynamics to Species Conservation**, European Doctoral School of Demography (EDSD), Odense, Denmark. [Link to Program](#)

Conde D. A. & Staerk, J. Biodiversity, Conservation and Species Management. 10 ECTS Master level course. [Link to Course Evaluation](#)

Alexiadou, I. **Research and Analysis on the possible laundering of the critically endangered ASAP species as “captive-bred” in the international market**, unpublished Master thesis, 29.01.2019, University of Southern Denmark

Description: Analyses of the international trade of the IUCN Specialist Group: Asian Species Action Partnership (ASAP) species. Assessing commercial trade of live specimens declared as captive bred. The goal will be to use as much as possible ZIMS data to assess the number of females required to produce the exported numbers reported in the CITES Trade Database.

Supervisors: **Dalia A. Conde & Johanna Staerk**

Project in collaboration with the Species360 Conservation Science Alliance and the [IUCN Specialist Group ASAP](#)

2018

Hedeager, J. **Maximizing the conservation value of zoo and aquarium populations: Assessing the alignment of species breeding programs with global prioritization schemes.** Unpublished Master thesis, June 2018, University of Southern Denmark

Description: Maximizing the conservation value of zoo & aquarium populations: Assessing the Alignment of Species breeding programs with global prioritization schemes Based on the thesis we are working with Regional Associations to prepare a manuscript for publication. Project in collaboration with the Species360 Conservation Science Alliance, [CPop SDU](#) and [Gviskuid Zoo](#).

Frederiken, C. H. **Using demography to unveil laundering of species as “captive bred “ in the international trade.** June 2018, unpublished Master thesis, University of Southern Denmark.

Description: Investigating international trade of Asian Big Cats using a fertility analysis based on ZIMS data. project in collaboration with the Species360 Conservation Science Alliance and CPop SDU.

Sørensen, L. **Laundering of species as captive bred in the international markets: a study case for three highly traded tortoises,** unpublished Bachelor thesis, June 2018. Project in collaboration with the Species360 Conservation Science Alliance and CPop SDU.

Description: Analysis of the CITES trade database for *Geochelone elegans*, *Testudo hermanni*, and *Centrochelys sulcata*. Project in collaboration with the Species360 Conservation Science Alliance, SDU and Vissenbjerg [Terriaret](#)

2017

Staerk, J. **Filling Demographic Knowledge Gaps for the Conservation of Threatened Species,** unpublished PhD thesis, August 2017, University of Southern Denmark.

Supervisors: **Prof. Dalia A. Conde** & Prof. Fernando Colchero

PhD Assessment Committee: [Prof. Yvonne Buckley](#) (Trinity College Dublin), Dr.

[Manfred Niekisch](#) (Zoologischer Garten Frankfurt), Assoc. Prof. [Rune Lindahl-Jacobsen](#) (SDU)

CONSERVATION PLANNING SPECIALIST GROUPS (CPSG) WORKING GROUP REPORTS (2016-2019):

- Staerk, J., da Silva, R., Conde, D.A. Shepherd, C.R. **Investigating patterns of international wildlife trade in ASAP species,** Conservation Planning Specialist Group, 2018 Annual meeting, Available [here](#) (see page 8).
 - Conde, D.A., Guenter, J., **Data Science for the One Plan Approach: Exploring the potential of**
 - **Species360 in synergy with other biodiversity databases,** Conservation Planning Specialist Group, 2017 Annual meeting, Available [here](#) (see page 9).
 - Conde, D. A., Ryder, O., Staerk, J. **Prioritizing the Collection of Samples for Genetic Rescue** Conservation Planning Specialist Group, 2016 Annual meeting, Available [here](#) (see page 5).
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