

## Conservation Science Alliance Work Outputs 2018-2019

### CURRENT MEMBERS:

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Assoc. Prof. [Dalia A. Conde](#), Director of Science  
Dr. [Johanna Staerk](#), Research coordinator  
[Rita, da Silva](#), Ph.D. student, [SDU](#)  
[Andrew Mooney](#), Ph.D. student, Trinity College Dublin

Line Sørensen, Master Student ([SDU](#))  
Rikke Nielsen, Master Student ([SDU](#))  
Cecilie Fredersiksen, Master Student ([European Doctoral School of Demography](#))

### ONGOING PROJECTS

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Mooney, A., Staerk, J., Ryder, O., Buckley Y.M. Conde, D.A. **Biobanking - 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.

Da Silva, R., Colchero, F., Shepherd, C.R., Jouvét, L., Staerk, J., Janssen, J., Conde, D.A. **The international commercial trade of live turtles and tortoises: exploring patterns and hotspots for legislative change.** *In prep. (Peer review journal).*

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., Colchero, F. Conde, D.A. **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.

Mooney, A., Teare, A., Buckley Y.M. Conde, D.A. **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.

Mooney, A. Conde D.A., Healy K, Buckley Y.M. **Few large animals or many small? Managing zoo collections for in situ conservation activity.** *In prep. (Peer-review journal)*.

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.

Alberts, S. Colchero, F. Conde, D.A. et al. **The evolutionary landscape of primate longevity.** *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.

## PUBLICATIONS

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### 2019

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 \(2019\)](#)

**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](#)

Ilieva, I., Jouvett, 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 World's 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](https://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](#)

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. Siriaroonat, 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.

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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.

## OTHER DOCUMENTS

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European Habitats Forum (2019). **The implementation of the EU 2020 Biodiversity Strategy and recommendations for the post-2020 Biodiversity Strategy** (Opinion statement from WWF, Nature Conservancy etc. to recommend the Species Knowledge Index, page 5). [Link](#)

## WORKSHOPS

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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

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2019

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, San Diego Zoo Global Board and Conservation Council, 13th June 2019, San Diego Zoo Safari Park, California, USA.

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, Los Angeles Zoo and Botanical Gardens, 12th June 2019, Los Angeles, California, USA.

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, Wildlife Conservation Society, 6th June 2019, Bronx Zoo, New York, USA.

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, San Diego Zoo Global, 21st May 2019, San Diego Zoo Safari Park, California, USA.

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, SeaWorld San Diego, 21st May 2019, San Diego, California, USA.

**Mooney, A., Guenter, J., Species360 Conservation Science Alliance Research Presentation**, EAZA Directors' Days, 23<sup>rd</sup> – 25<sup>th</sup> April 2019, Jersey Zoo, St. Helier, Jersey

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, Birch Aquarium at Scripps Institution of Oceanography, 9<sup>th</sup> April 2019, La Jolla, California, USA.

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, Aquarium of the Pacific, 21st March 2019, Long Beach, California, USA.

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, Shark Reef Aquarium at Mandalay Bay, 5<sup>th</sup> March 2019, Las Vegas, Nevada, USA.

**Mooney, A.** (Invited Speaker), **Species360 Conservation Science Alliance Research Presentation**, Dublin Zoo, 14<sup>th</sup> January 2019, Dublin, Ireland.

**Mooney, A., Zoos: Does Size Matter?**, 2<sup>nd</sup> Irish Ecological Association Conference, 10<sup>th</sup>-12<sup>th</sup> 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 5<sup>th</sup> -8<sup>th</sup> [Conference program](#)

Staerk, J. (Plenary) **Presentation of tools for species conservation**, in collaboration with the Species Conservation Toolkit Initiative, IUCN Conservation Planning Specialist Group (CPSG), October 18-21<sup>st</sup>, 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- 28<sup>th</sup>

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.  
<https://indico.egi.eu/indico/event/3973/session/32/contribution/9>

Conde, D.A. (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- 28<sup>th</sup>.  
[Link to presentation \(pdf\)](#)

Capacity Building

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## ONGOING

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

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.

Silva, D.A. **Assessment of biodiversity knowledge gaps**, 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

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. 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 [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 (2015-2019):

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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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