

PERSONAL INFORMATION

Maria Paniw, Ecological & Forestry Applications Research Centre (CREAF) UAB - 08193 Cerdanyola del Vallès
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EDUCATION

2012-2016: **PhD Plant Demography and Evolutionary Biology**, Univ. Cadiz, Spain

Thesis: Demography and Evolutionary Ecology of Carnivorous Subshrub *Drosophyllum lusitanicum* (L.)

Link (Drosopyllaceae) – *summa cum laude* mention for thesis.

Available at: <https://dialnet.unirioja.es/servlet/tesis?codigo=56716>

Supervisors: Prof. Fernando Ojeda and Dr. Roberto Salguero-Gómez

2009-2011: **M.S. Environmental Sciences**, Johns Hopkins Univ., USA (GPA: 4.0 – honors mention)

Thesis: Determining the potential distribution of highly invasive plants in the Carpathian Mountains of

Ukraine using Maxent and BIOCLIM. Available at: <http://jhir.library.jhu.edu/handle/1774.2/35707>

Supervisor: Prof. Bohdan Prots

2006-2009: **B.A. History (Biology minor)**, Univ. Maryland, USA (GPA: 4.0 – honors mention)

PROFESSIONAL EXPERIENCE

Apr 2019-ongoing: **Juan de la Cierva Fellow**, Ecological and Forestry Applications Research Center, Spain

Apr 2019-ongoing: **Research Associate**, Univ. Zurich, CH

Nov 2018- Mar 2019: Maternity leave

Dec 2016-Mar 2019: **Postdoctoral Researcher**, Univ. Zurich, CH

Jun 2012- Nov 2012: **Research Assistant**, Univ. Cadiz, Spain

Feb 2011-Mar 2012: **Teaching Assistant** (mathematics & statistics), Education Center Aviano Air Base, Italy

LEADERSHIP AND MANAGEMENT

2020-ongoing: Associate Editor (accepted in mentee training) for Journal of Applied Ecology

2019-ongoing: Co-manager of Matorral Resilience Project

2016-ongoing: Leader of Dewy Pine Long-Term Demography Project

Details on projects: <https://globalchangeeco.com>

RESEARCH SUMMARY

My research focuses on answering one of the most pressing ecological questions: **when does environmental change lead to changes in life-history processes and population persistence?** To answer this question, I use **state-of-art statistical modelling tools** to link abiotic and biotic drivers to trait and population dynamics in both plant and animal species. I am particularly interested in gaining a better understanding of (a) **seasonal biotic and abiotic processes** that shape annual population dynamics; (b) the effects of **vital-rate covariation** on population projections; and (c) **life-history differences in demographic responses to changes in environmental patterning**, such as increases in extreme events. Most recently, I am also investigating how the **community responses to extreme events** can be understood better by considering underlying, species-specific life-history processes. My expertise in statistical modelling and biodemography is evidenced by the **numerous modelling workshops** I have instructed and the **lectures** I have been invited to give in the last three years. Meanwhile, I consider the ultimate goal of parameterizing biodemographic models to perform **comparative analyses**, while working with a large network of collaborators.

FUNDING - GRANT PROPOSALS AND FELLOWSHIPS

As principle investigator (PI)

2020-2022: *Species Persistence in Changing Seasonal Environments: A new holistic framework integrating demography and biotic interactions (SEASON)*. H2020-MSCA-IF-2019 grant #894223 (€ 173,000)

2019-2020: Juan de la Cierva-Formación fellowship. Spanish Ministry of Science (FJCI-2017-32893) – highest national score in category “Plant Biology and Environmental Sciences”

2019: Workshop for review paper on animal demographic models. iDiv, Germany (€ 3,400)

As core team member

2018-2022: *Population Persistence under Environmental Change: Unified Framework*. Swiss National Funding Grant (31003A_182286) (€ 800,000)

2016-2019: *Reinterpretation of the biogeographic and ecological singularity of Mediterranean heathlands*. Spanish Ministry of Economy (CGL2015-64007-P) (€ 100,000)

2016: *sAPROPOS - Analysis of PROjections of POPulationS*. iDiv (€ 32,130)

2012-2016: FPI PhD fellow in project *Geographic barrier, habitat fragmentation and vulnerability of endemics: Biodiversity patterns of Mediterranean heathlands*. Spanish Ministry of Economy (CGL2011-28759)

AWARDS

2019: Ecological Forecasting Outstanding Publication Award (for Paniw *et al.* 2019, *Science*), Ecological Society of America (\$ 200)

2018: - Best PhD thesis award for highest scientific output, Univ. Cadiz
- H2020-MSCA-IF-2017 – Seal of Excellence

2017: GRC Travel Grant, Graduate Campus (UZH) – 2-weeks academic stay at Univ. Sheffield (€ 1,000)

2016: - Outstanding PhD Thesis, Univ. Cadiz (€ 1,000)
- Travel award, Spanish Ministry of Economy – 2-months academic stay at Univ. Zurich (€ 2,684)

2015: - Real Brown Travel Award, Ecological Society of America (\$ 500)
- Runner-up award (£ 40) for best student poster at BES Symposium: Demography Beyond the Population.

2014: Travel award, Spanish Ministry of Economy – 4-months academic stay Univ. Central Florida (€ 6,480)

MAJOR COLLABORATIONS

Current

- Prof. A. Ozgul (Univ. Zurich); Serengeti Lion Project; Botswana Predator Conservation Trust, Striped Mouse Project: **Spatiotemporal population responses to environmental change**, part of SNF grant 31003A_182286
- Prof T. Clutton-Brock (Univ. Cambridge): **Group dynamics & demography in cooperative vertebrates**, part of ERC Advanced Grant 742808
- Prof F. Lloret (CREAF): **Community resilience under extreme drought events**
- Kalahari Meerkat Project, Rocky Mountain Biological Laboratory, Siberian Jay Project: **Animal phenotypic responses to environmental change – 2 joint publications**
- Prof F. Ojeda (FEBIMED, Univ. Cadiz): **Long-term demography of dewy pines**
- Prof. R. Salguero-Gómez (Univ. Oxford), Prof. T. Knight (iDiv) (and > 18 researchers): **Projecting population dynamics under climate change (sAPROPOS) - 2 joint publications in preparation**

Past

2016: Dr. A. Cross (Univ. Western Australia): **Trophic interactions of carnivorous plants – 2 joint publications**

2014: Prof. P. Quintana-Ascencio (Univ. Central Florida): **Integral projection models for fire-adapted species – 2 joint publications**

2011-2013: Prof. B. Prots (WWF Ukraine): **Invasive-species management in Carpathians - 3 joint publications**

PUBLICATIONS

*EQUAL CONTRIBUTION; # MENTEE; ● FORMER LAST NAME

Refereed articles

19. **Paniw M**, Childs D, Armitage KB, Blumstein DT, Oli M, Martin J, Ozgul A. Assessing seasonal demographic covariation to understand environmental-change impacts on a hibernating mammal, *Ecology Letters* **23**:588-597.

18. Postuma M, Schmid M, Guillaume F, Ozgul A, **Paniw M**. The effect of temporal environmental autocorrelation on eco-evolutionary dynamics across life history. *Ecosphere*, in press.
17. **Paniw M**, Maag N, Cozzi G, Clutton-Brock T, Ozgul A. 2019. Life-history responses of meerkats to seasonal changes in extreme environments. *Science* 363: 631-635. – [data & code on GitHub](#)
16. **Paniw M**. Integrando mecanismos evolutivos y dinámica de poblaciones de plantas: una perspectiva desde la demografía animal. *Ecosistemas* 28: 60-68.
15. Skates LM, **Paniw M**, Cross AT, Ojeda F, Dixon KW, Stevens JC, Gebauer G. 2019. An ecological perspective on “plant carnivory beyond bogs”: nutritional benefits of prey capture for the Mediterranean carnivorous plant *Drosophyllum lusitanicum*. *Ann. Bot.* 124:65-75. – [In AoB Drought Highlight Issue \(<https://doi.org/10.1093/aob/mcz111>\)](#)
14. Gómez-González S, **Paniw M**, Antunes K, Ojeda F. 2018. Heat shock and plant leachates regulate seed germination of the endangered carnivorous plant *Drosophyllum lusitanicum*. *Web Ecol.* 18: 7-13.
13. **Paniw M**, Ozgul A, Salguero-Gómez R. 2018. Interactive life-history traits predict sensitivity of plants and animals to temporal autocorrelation. *Ecol. Lett.* 21: 275-286. – [data & code on Dryad](#).
12. Villar-Navarro E, Baena-Nogueras R, **Paniw M**, Perales JA, Lara-Martin P. 2018. Removal of pharmaceuticals in urban wastewater: high rate algae ponds (HRAP) as an alternative to conventional technologies. *Water Res.* 139: 19-29.
11. Corada Fernandez C, Torres-Fuentes N, Pintado-Herrera M, Candela L, **Paniw M**, González-Mazo E. 2017. Effects of extreme rainfall events on the distribution of selected emerging contaminants in surface and groundwater: The Guadalete River Basin (SW, Spain). *Sci. Tot. Env.* 605: 770-783.
10. Cross A, **Paniw M**, Ojeda F, Turner SA, Dixon KW, Merritt DJ. 2017. Defining the role of fire in alleviating seed dormancy in a rare Mediterranean endemic subshrub. *AoB Plants* 9: plx036.
9. **Paniw M**, #Gil-Cabeza E, Ojeda F. 2017. Plant carnivory beyond bogs: reliance on prey feeding in *Drosophyllum lusitanicum* in dry Mediterranean heathland habitats. *Ann. Bot.* 119: 1035-1041.
8. **Paniw M**, Quintana-Ascencio PF, Ojeda F, Salguero-Gómez R. 2017. Accounting for uncertainty in dormant life stages in stochastic demographic models. *Oikos* 126: 900-909. – [data & code on Dryad](#).
7. **Paniw M**, Quintana-Ascencio PF, Ojeda F, Salguero-Gómez R. 2017. Interacting livestock and fire may both threaten and increase viability of a fire-adapted Mediterranean carnivorous subshrub. *J. Appl. Ecol.* 54: 1884-1894. – [data & code on Dryad](#).
6. **Paniw M**, Salguero-Gómez R, Ojeda F. 2017. Transient facilitation of resprouting shrubs in fire-prone habitats. *J. Plant Ecol.* rtx019.
5. *#Salces-Castellano A, ***Paniw M**, Casimiro-Soriguer R, Ojeda F. 2016. Attract them anyway - Benefits of large, showy flowers in a highly autogamous, carnivorous plant species. *AoB Plants* 8: plw017.
4. *#Bertol N, ***Paniw M**, Ojeda F. 2015. Effective prey attraction in the rare *Drosophyllum lusitanicum*, a flypaper-trap carnivorous plant. *Am. J. Bot.* 102: 689-694.
3. **Paniw M**, Salguero-Gómez R, Ojeda F. 2015. Local-scale disturbances can benefit an endangered, fire-adapted plant species in W Mediterranean heathlands in the absence of fire. *Biol. Cons.* 187: 74-81.
2. **Paniw M**, Gil-López MJ, Segarra-Moragues JG. 2014. Isolation and characterization of microsatellite loci in the carnivorous subshrub *Drosophyllum lusitanicum*. *Biochem. Syst. Ecol.* 57: 416-419.
1. •**Simpson M**, Prots, B. Predicting the distribution of highly invasive plants in the Ukrainian Carpathians under climatic and land-use change: implications for biodiversity conservation. *Env. Cons.* 40: 161-181.

Non-refereed articles

4. **Paniw M**, Salguero-Gómez R, Ojeda F. 2017. Apuntes ecológicos sobre *Drosophyllum lusitanicum*, una especie singular de planta carnívora. *El Corzo Volumen V*.
3. Prots B, •**Simpson M**. 2012. Habitats suitability of highly invasive plant species in the Ukrainian part of the Upper Tysa basin. *Transylvanian Review of Systematical and Ecological Research* 11: 57-66.
2. •**Simpson M**, Prots B & Vykhov B. 2011. Modeling of the distribution of invasive plants: case study of Sosnowski's hogweed *Heracleum sosnowskyi* Manden in the Ukrainian Carpathian Mts. *Biologichni Systemy*

(Biological Systems) 3: 80-89.

1. ● **Simpson M**, Ojeda F. 2010. *Pinus pinaster* en las sierras del Aljibe y del campo de Gibraltar: ¿especie nativa o cultivo forestal? *Almoraima* 40: 113-122.

Book chapters

2. **Paniw M**, Cozzi G, Sommer S, Ozgul A. Demographic processes in socially structured populations. In Gamelon M, Salguero-Gómez R. (eds.) *Demographic Methods Across the Tree of Life*, in review.
1. Cross A, **Paniw M**, Scatigna A, Kalfas N, Anderson B, Givnish T, Fleischmann A. 2016. Systematics and evolution of small genera of carnivorous plants. In Ellison, AM, Adamec L. (eds.) *Carnivorous Plants: Physiology, Ecology, and Evolution*, 600 pp.

ARTICLES SUBMITTED/UNDER REVIEW

MENTEE

1. #Lenzi O, Ozgul A, Salguero-Gómez R, **Paniw M**. Reproductive strategy, not pace of life, predicts buffering versus lability in animals, in revision (*Ecology*).
3. Maag N, Cozzi G, **Paniw M**, Manser M, Clutton-Brock T, Ozgul A. Increased fecundity in dispersing helpers and its implications for cooperative breeder population dynamics, submitted.
4. Paniw M, James T, Archer CR, Römer G, Levin S, Compagnoni A, Che-Castaldo J, Bennett JM, Mooney M, Childs DZ, Ozgul A, Jones OR, Burns JH, Beckerman AP, Patwary A, Sanchez-Gassen N, Knight TM, Salguero-Gómez R. Global analysis reveals complex demographic responses of mammals to climate change, in review (*PNAS*). Preprint available on *bioRxiv* (<https://doi.org/10.1101/2019.12.16.878348>).
5. Compagnoni A, Levin S, Childs DZ, Harpole S, **Paniw M**, Römer G, Burns JH, Che-Castaldo J, Rüger N, Kunstler G, Bennett JM, Archer CR, Jones OR, Salguero-Gómez R, Knight TM. Biome and life-history strategy explain the effects of climate on plant population performance, in revision (*Ecology Letters*).
6. Schmid M, **Paniw M**, Postuma M, Ozgul A, Guillaume F. A tradeoff between robustness to environmental fluctuations and speed of evolution, submitted. Preprint available on *bioRxiv* (<https://doi.org/10.1101/834234>).

PUBLICATIONS IN PREPARATION

1. **Paniw M**, Lloret F. Community resilience to extreme events is mediated by species' demography.
2. #Conquet E, Ozgul A, **Paniw M**. Life-history sensitivity to seasonality.
3. **Paniw M**, Griesser M, Ozgul A. Social structure buffers against spatiotemporal changes in habitat quality.
4. van Benthem K, **Paniw M**, Ozgul A. Trait changes precede population collapse in a small mammal.
5. Aujla S, **Paniw M**, Childs D, Rees M, Salguero-Gómez R. Density effects on the demography of a carnivorous plant species.

OUTREACH

- Resilient Meerkats: How do meerkat populations respond to extreme climatic variation? *Nature News & Views* (2019)
- Asociación Española de Plantas Carnívoras (2016). Interview on *Drosophyllum* (<http://www.daepc.org/>)
- Rasenberg (2015) BioNieuws. Prey capture in *Drosophyllum*.
- UCA Investigación (2015) HERRIZA (<https://www.youtube.com/watch?v=u0YpOcl27Nw>)

ORGANIZED EVENTS

- 2019: Integral Projection Models (IPMs): a trait-based approach to investigate mechanisms of population responses to environmental change. XVI *EcoFlor*, Granada.
- 2015: Demographic buffering beyond the comfort zone: species' responses to anthropogenic disturbances. *Ecological Society of America 100th Annual Meeting*.

Invited speaker

- 2019: - Understanding how environmental-change drives population dynamics: the overlooked role of seasonality. *CNRS, Strasbourg, France.*
 - Tradeoffs, carry-over effects, and density dependence: Towards a mechanistic understanding of resilience in population ecology. *BES Annual Meeting*
- 2018: - Understanding the effects of seasonality on population dynamics under global environmental change. *Univ. Zurich.*
 - Beyond simple environment-demography relationships: Climate-density interactions shape seasonal population dynamics in a semi-arid ecosystem. *Univ. Sheffield.*
 - Population dynamics in aquatic systems: The elephant in the comparative-demography room. *Univ. Cadiz*
- 2017: - Life-history traits and sensitivity of plants and animals to temporal autocorrelation. *Univ. Zurich*
 - Demographic analyses and global patterns of species' vulnerability to climate change: Setting a new research agenda for the population ecology of terrestrial vertebrates. *iDiv, Germany.*
- 2015: Population viability of a disturbance-dependent plant species in natural and human-induced environments. *ESA 100th Annual Meeting.*
- 2014: Population viability of a disturbance-dependent plant species using Bayesian models. *Mathematical Biology Seminar.* Univ. Central Florida.

Other (oral presentation unless otherwise indicated)

- 2019: - **Paniw M**, Ozgul A. Linking dispersal to spatiotemporal population dynamics. *Mongoose International Meeting.* Univ. Zurich
 - Lloret F & Paniw M. Resilience and demographic features in Mediterranean shrub communities after drought-induced dieback. *BES Annual Meeting.* Belfast, Ireland.
- 2018: - #Martin-Rodriguez I, et al. Effects of anthropogenic disturbances on the genetic diversity of a rare carnivorous plant species across its entire range. *Evolution Meeting.* (Poster)
 - **Paniw M**, Ozgul A. Life-history responses to seasonal changes in extreme environments. *Mongoose International Meeting.* Univ. Cambridge.
 - #Conquet E, et al. Population responses to changes in vital-rate periodic patterns. *BES Annual Meeting.* Birmingham, UK.
- 2017: - Compagnoni A, et al. Understanding the effect of climate on plant population dynamics: the moving window approach. *Evolutionary Demography Society Annual Meeting.* Lyon, France. (Oral & poster)
 - #Lenzi O, et al. Demographic buffering vs. lability in animal populations. *BES Joint Annual Meeting: Ecology Across Borders.* Ghent, Belgium.
 - **Paniw M**, Ozgul A, Salguero-Gómez R. A wide range of life histories across plants and animals are sensitive to temporal autocorrelation in demographic processes. *BES Joint Annual Meeting,* Ghent, Belgium.
 - **Paniw M**, Ozgul A, Salguero-Gómez R. Interactive life-history traits predict sensitivity of plants and animals to temporal autocorrelation. *Evolutionary Demography Society Annual Meeting.* Lyon, France. (Oral & poster)
- 2015: **Paniw M**, Salguero-Gómez R. Life cycles and vital-rate uncertainties in plants: integrating Bayesian analyses and integral projection models. *BES Symposium: Demography Beyond the Population.* Sheffield, UK. (Oral & poster)
- 2014: - **Paniw M**, Salguero-Gómez R, Ojeda F. Sleeping with the enemy: Short- and long-term effects of resprouting shrubs on the performance of a post-fire recruiting, carnivorous plant. *ESA 99th Annual Meeting.* Sacramento, USA.
 - **Paniw M**, Salguero-Gómez R, Ojeda F. Age-specific differences in reproductive patterns in the carnivorous plant *Drosophyllum lusitanicum*. *ECOFLORE.* Puerto Real, Spain.

- 2013: - **Paniw M**, Ojeda F, Salguero-Gómez R. Fire and extinction of a rare carnivorous species. *Evolutionary Demography Society – First Annual Meeting*. Odense, Denmark. (Lightning talk)
 - **Paniw M**, Ojeda F. Rainfall, disturbance and extinction risk of the carnivorous plant *Drosophyllum lusitanicum* (L.) Link (Drosophyllaceae). *EcoGenes – Adapting to Global Change in the Mediterranean Hotspot*. Seville, Spain. (Poster)

WORKSHOPS, COURSES, AND CERTIFICATES

- 2016: - Comparative Approaches in Ecology and Evolution, International Max Planck Research School for Demography, Germany
 - Integrated Population Models (IPM), Vogelwarte, Switzerland
 2014: Individual-Based Modeling (IBM), Transmitting Science, Spain
 2013: Evolutionary Biology, University of Lausanne, Switzerland
 2012: - Population Structure Inference, Instituto Gulbenkian de Ciências, Portugal
 - Integral Projection Models (IPMs), International Max Planck Research School for Demography, Germany
 - Spatial Demography, International Max Planck Research School for Demography, Rostock, Germany

RELEVANT SKILLS AND COMPETENCES

Quantitative tools: Proficiency in R; Bayesian modelling in *WinBUGS*, *JAGS*, *Stan*; Proficiency in ArcGIS and QGIS; Working knowledge of Python and Markdown; Experience with cluster computing
Languages: fluent in Ukrainian (native), German (native), English, French, and Spanish

TEACHING

● **ORGANIZER/INSTRUCTOR**; ∅ **ASSISTING INSTRUCTOR**

- 2017/2018: Biology of Reproduction (4 days) ●; Population Ecology (1 day) ∅ & Analysis & Mgmt. of Biological Populations (1 day) ∅, Univ. Zurich
 2016/2017: Integral projection models, Transmitting Science, Barcelona (1 wk) ∅
 2016: Introduction to R (1 wk) ● & Experimental design and analysis in R (1 week) ●, Univ. Cadiz
 2015: - Biological/Ecological Statistics with R (4 wks) ● & Botany lab/field practicals (2 wks) ∅, Univ. Cadiz
 - Integral projection models with IPMpack. Max Planck Institute, Rostock (1 wk) ∅
 2014: Introduction to integral projection models, ESA, USA (1 day) ∅

Higher Education Accreditation: ANECA – Profesor Ayudante Doctor & Profesor Contratado Doctor

MENTORING

PhD theses

Eva Conquet: *trait and demographic responses to environmental change*, Univ. Zurich, 2019-ongoing.
 Irene Martin: *population genetics and conservation management*, Univ. Cadiz, 2017-2019.

Master's Theses

Valentin Graf: *cross seasonal demographic tradeoffs*, Univ. Zurich, 2019-ongoing.
 Maarten Postuma: *trait adaptations to environmental patterning*, Radboud Univ., 2018.
 Eva Conquet: *seasonal matrix population models*, Univ. Toulouse, 2018.
 Omar Lenzi: *comparative demographic analyses*, Univ. Zurich, 2018.
 Ester Gil: *plant-insect trophic interactions*, Univ. Cadiz, 2015.
 Antonia Salces-Castellano *plant reproduction*, Univ. Cadiz, 2014 (best thesis award).

Bachelor's Thesis

Nils Bertol: *mechanisms of plant carnivory*, Univ. Cadiz, 2014.

PROFESSIONAL MEMBERSHIPS

Ecological Society of America; British Ecological Society; Ecological Forecasting Initiative

REVIEW ACTIVITIES

Reviewer for 14 journals (in total > 30 reviewed manuscripts): *Anim. Conserv.*, *J. Ecol.*, *Methods Ecol. Evol.*, *Oecologia*, *Biotropica*, *Ecology*, *Pop. Ecol.*, *Ecol. Lett.*, *Plant and Soil*, *PlosOne*, *Ecol. Model.*, *Oikos*, *Wat. Scie. Tech.*, *Glob. Change Biol.*