UNIVERSIDAD DE GRANADA

Departamento de
Ecología

Restauración Ecológica (RNM 918)

GRUPO DE INVESTIGACIÓN EN RESTAURACIÓN ECOLÓGICA

Presentación

En nuestro grupo nos dedicamos a investigar en restauración ecológica utilizando tecnologías innovadoras como siembras de precisión, protectores de semillas, semillas inteligentes o drones. Además, estudiamos los aspectos ecológicos y ecofisiológicos que determinan el éxito de la restauración de los ecosistemas forestales o de matorrales. Nuestro objetivo principal es recuperar y preservar los ecosistemas naturales, promoviendo la biodiversidad y contribuyendo a la conservación del medio ambiente.

La restauración ecológica es una disciplina clave en un mundo donde la degradación ambiental y la pérdida de hábitats naturales son cada vez más preocupantes. Buscamos maximizar la eficiencia y efectividad en proyectos de restauración para poder desarrollarlos a gran escala, desarrollando métodos y técnicas innovadoras que puedan ser aplicadas tanto en entornos naturales como en áreas degradadas, tales como zonas afectadas por incendios forestales o actividades humanas.

Nuestro equipo multidisciplinar está compuesto por expertos en biología, ecología, tecnología y análisis de datos. Trabajamos en colaboración con organizaciones locales, instituciones gubernamentales y otras universidades para abordar los desafíos más urgentes en la restauración ecológica.

A través de nuestras investigaciones, nos comprometemos a difundir el conocimiento y concienciar sobre la importancia de la restauración ecológica. Llevamos a cabo experimentos científicos, publicamos investigaciones en revistas relevantes del sector, y participamos en conferencias y congresos para compartir nuestros avances y promover la participación ciudadana en la conservación del medio ambiente.
Si estás interesado en nuestros proyectos, colaboraciones o tienes alguna pregunta, ¡no dudes en ponerte en contacto con nosotros!

Personal

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- Responsable del grupo: Castro Gutierrez, Jorge
- Miembros:
  - Juan Ovejero, Raquel
  - Lázaro González, Alba
  - Leverkus , Alexandro B.
  - Reyes Martín, Marino Pedro
  - Sampere Medina, María

Líneas de investigación

- Restauración de ecosistemas terrestres
- Conservación de la biodiversidad
- Interaccionas planta-animal: dispersión de semillas y herbivoría
- Interacciones suelo-planta
- Servicios ecosistémicos
- Regeneración de ecosistemas perturbados

Proyectos de investigación

- Título: Efecto del fuego sobre la diversidad de insectos claves (Hormigas y Abejas) en el monte andaluz: aspectos funcionales e implicaciones para la conservación.
  - Entidad financiadora: Consejería de Innovación, Ciencia y Empresa. Junta de Andalucía.
  - Entidades participantes: Universidad de Granada. Estación Biológica de Doñana. Universidad Autónoma de Barcelona. CREAF. Universidad de Tel Aviv.
  - Duración: desde: 2014 hasta: 2018
  - Investigador responsable: Jorge Castro
  - Número de investigadores participantes: 11
  - Financiación concedida: 163.000 euros

Tesis Doctorales defendidas en el seno del grupo

- Doctorando: Carlos Ruben Molinas González.
  - Título: Dinámica post-incendio de la madera muerta e implicaciones de su manejo para las comunidades de insectos.
  - Directores: Jorge Castro Gutiérrez, Alex B. Leverkus.
  - Fecha de lectura: 30 de enero de 2020.
- Doctorando: Diego Francisco Salazar Tortosa.
  - Título: Factores que determinan la respuesta de los pinos ante un escenario de cambio global: una aproximación ecofisiológica y evolutiva.
  - Directores: Jorge Castro Gutiérrez, Rafael Rubio de Casas.
  - Fecha de lectura: 14 de enero de 2019.

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Publicaciones

- ## 2026
  - Morales-Rueda F., Castro J., Holl K.D. (2026). **Improving the promise of drone seeding for restoration**. Trends in Ecology and Evolution 41:1006-1010 (doi: 10.1016/j.tree.2026.09.004). (pdf)
  - Morales-Rueda F., Nyasuku Maganizo K., Fischer H.W., Fetzer I., Tabik S., Alcaraz-Segura D., Castro J. (2026). **AI-driven forest restoration: a governance framework for people and nature**. Environmental Science and Policy 183, 104463. Doi: https://doi.org/10.1016/j.envsci.2026.104463
  - Castro J., Pérez-García M., Lovenstein H., Pedrini S. (2026). **Seeding pines in the Mediterranean region**. Reforesta 21:10-31 https://doi.org/10.21750/refor.21.02.132
  - Leverkus A.B., Medina M., Lázaro-Gonzalez A., ...Castro J., ...Wending V. (2026). **Drivers of seedling emergence and early growth of 12 European oak species: Results from a cross-continental experiment.** Forest Ecology and Management 599:123223 https://doi.org/10.1016/j.foreco.2025.123223
- ## 2025
  - Juan-Ovejero, R., Castro, J., Navarro, F.B., Rodríguez-Caballero, E., Reyes-Martín, M.P., Alcaraz-Segura, D., Jiménez, M.N., Leverkus, A.B. (2025). **Effect of revegetation method (seedling outplanting versus direct seeding) on holm oak root architecture: Implications for restoration success under a global change scenario.** Forest Ecology and Management 598, 123187. https://doi.org/10.1016/j.foreco.2025.123187
- ## 2024
  - Salazar-Tortosa D., Saladin B., Castro J., Rubio de Casas R. (2024). **Climate change is predicted to impact the global distribution and richness of pines (genus Pinus) by 2070**. Diversity and Distributions 30:e13849 (https://doi.org/10.1111/ddi.13849)
  - Castro J., Alcaraz-Segura D., Baltzer J.L., Amorós L., Morales-Rueda F., Tabik S. (2024). **Automated precise seeding with drones and artificial intelligence: a workflow**. Restoration Ecology 32 (5) e14164 (doi: 10.1111/rec.14164). URI: https://hdl.handle.net/10481/98706
  - Juan-Ovejero, R., Castro, J., Navarro, F.B., Moreno-Rojas, J.M., Jiménez, M.N., Leverkus, A.B., & Querejeta, J.I. (2024) **Large physiological plasticity of water- and nutrient-use traits in Quercus ilex L. within and across populations: Implications for Mediterranean forest persistence under global change.** Environmental and Experimental Botany, 228, 106053. https://doi.org/10.1016/j.envexpbot.2024.106053

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- Castro, J. (2024), **Human urine does not protect acorns against predation by the wood mouse (Apodemus sylvaticus): a field study with video recording**. Restor Ecol e14139. https://doi.org/10.1111/rec.14139

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  - Castro, J., Morales-Rueda, F., Alcaraz-Segura, D. and Tabik, S. (2023), **Forest restoration is more than firing seeds from a drone**. Restor Ecol, 31: e13736. https://doi.org/10.1111/rec.13736
  - Juan-Ovejero, R., Elghouat, A., Navarro, C.J., Reyes-Martín, M.P., Jiménez, M.N., Navarro, F.B., Alcaraz-Segura, D. & Castro, J. **Estimation of aboveground biomass and carbon stocks of Quercus ilex L. saplings using UAV-derived RGB imagery**. Annals of Forest Science 80, 44. https://doi.org/10.1186/s13595-023-01210-x
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  - Juli Pausas, Leverkus AB, 2023. **Disturbance ecology in human societies**. People and Nature 5: 1082-1093 https://doi.org/10.1002/pan3.10471
  - Lázaro-González A, Andivia E, Hampe A, Hasegawa S, Marzano R, Santos AMC, Castro J, Leverkus AB. 2023. **Revegetation through seeding or planting: A worldwide systematic map.** J Environ Manage 337:117713 https://doi.org/10.1016/j.jenvman.2023.117713
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