

European Ecosystems and Biodiversity: Fauna

ECOL-3000 (4 credits)

Biodiversity & Conservation in Europe

This syllabus is representative of a typical semester. Because courses develop and change over time to take advantage of unique learning opportunities, actual course content varies from semester to semester.

Course Description

This course explores the diverse animal life that shapes regional ecosystems. Through comparative field-based research, students will examine key animal species, their ecological roles, and the human and environmental factors influencing their conservation. The course addresses critical topics such as wildlife conservation, habitat management, invasive species, climate change effects, and the role of animals in ecosystem dynamics. With a focus on real-world field data and case studies, students will develop a deeper understanding of the challenges of preserving biodiversity across diverse ecosystems.

Learning Outcomes

Upon completion of the course, students will be able to:

1. **Analyze the ecological roles of key faunal species** across different ecosystems, including forest, grassland, wetland, and alpine environments.
2. **Compare regional conservation approaches** to protect endangered species and restore habitat connectivity across program sites.
3. **Assess the impacts of human activities**—such as agriculture, tourism, and urban expansion—on animal biodiversity and ecosystem health.
4. **Interpret ecological field data** to evaluate wildlife population trends, species interactions, and habitat quality.
5. **Critically examine case studies of invasive species and climate change**, understanding their implications for native fauna and long-term biodiversity.

Language of Instruction

This course is taught in English.

Instructional Methods

SIT's philosophy of education is rooted in experiential learning model, which drives the design of this class. Each module allows for experience, reflection, and application. Experiences range from critical analyses of datasets to site visits and conversations with local experts. These experiences are framed by readings, multimedia texts, and class discussion. Reflection

occurs throughout the learning process in various forms, such as verbal debriefs after learning on location experiences to reflexive components in papers/projects. Through reflection, students are encouraged to become aware of their process of learning, to make sense of their experiences, and connect the learning acquired on the program with previous experiences and information. Application activities reinforce learning by practicing communication skills, experimenting with theories, and preparing to transfer learning to future contexts.

Texts and Materials

- Articles on Course Reserve
- Field Journal (if print, weatherproof)
- Field glasses (recommended)

Assignments and Evaluation

1. **Participation & Professional Engagement – 10%** (Ongoing: Weeks 1–15)
Includes attendance, contribution to field discussions, cultural site visits, and group collaboration during workshops.
2. **Field Journal and Sketchbook – 30%** (Ongoing: Weeks 1–15)
Students will maintain a detailed, weekly field journal documenting their observations, sketches, and notes. Each week's journal entry should focus on the animals observed during field visits and activities, highlighting their behavior, interactions with the environment, and adaptations to local conditions. The journal will also include records of any observed impacts of human activity and climate change. Entries will be reviewed after each country block. The format can be print or digital. **Note:** This assignment is combined with the European Ecosystems and Biodiversity: Flora course. Credit for this course will focus on the Fauna entries.
3. **Habitat Narratives and Reflective Comparison – 40%** (3 narratives @ 10%, one per location; 10% for reflective comparison)
 - Narratives: Drawing from insights from the flora entries in the Field Journal and Sketchbook, students will adopt a specific ecological lens (e.g., pollination networks, invasive species, alpine adaptations, or disturbance ecology) and write short essays (800 words max) describing a representative plant community visited in the field. Each narrative should highlight key species interactions, ecological context, and evidence of environmental change or anthropogenic threats.
 - Multimedia Component: Students will accompany each written narrative with a **curated visual element** (photo montage, habitat sketch, annotated image, or short video/audio clip) that conveys the sensory, spatial, or seasonal qualities of the plant community.
 - Comparative Reflection: After completing all three narratives, students write a reflection (600–800 words) that compares their ecological lens across locations

and integrates cultural, aesthetic, and scientific perspectives on plant biodiversity and conservation values. Students should use their curated visual elements to illustrate their insights.

Note: This assignment is combined with the European Ecosystems and Biodiversity: Flora course. Credit for this course will focus on the Fauna entries.

4. **BioBlitz Field Biodiversity Survey – 20%**

In this immersive field-based activity, students will participate in a one-day BioBlitz—an intensive biological survey in which all species observed within a defined area and time are recorded. Working in small teams, students will identify flora present during the visit to Connemara National Park, using digital tools, field guides, and support from local experts. The goal is to develop ecological observation skills, contribute to biodiversity monitoring efforts, and reflect on the species richness, conservation value, and ecological roles of local wildlife in context. The BioBlitz has **3 stages** and **2 deliverables**:

- Pre-field session: Introduction to BioBlitz methods and tools (e.g., iNaturalist or Seek app).
- Field session: 3-hour BioBlitz survey in Connemara in designated micro-zones. Throughout the BioBlitz, teams will **Geo-tag entries in iNaturalist** with photos, GPS data, and basic taxonomic details. They will also submit digitally the **Team Species Inventory Sheet**.
- Post-field session: Debrief and group species inventory submission.

Note: This assignment is combined with the European Ecosystems and Biodiversity: Flora course. Credit for this course will focus on the Fauna entries.

Note on Attendance and Participation: Due to the nature of this experiential program, full participation in all classes and program activities is required. Students may not voluntarily opt out of required program activities. Valid reasons for absence – such as illness – must be discussed with the Program Director or other designated staff person. Absences impact academic performance, which may impact grades. Excessive, unexcused absences could result in program dismissal. Alternative work for absences will be expected.

Note on Late Assignments: IHP programs integrate traditional classroom lectures and discussion with field-based experiences, site visits and debriefs. It is critical that students complete assignments in a timely manner to continue to benefit from the sequences in assignments, reflections and experiences throughout the program. Extensions may be granted on a case-by-case basis with approval from the Program Director or other designated staff person. Requests must be made in writing and at least 12 hours before the posted due date

and time. Students who do not submit their work within the extension period will receive a failing grade.

Grading Scale

94-100%	A	74-76%	C
90-93%	A-	70-73%	C-
87-89%	B+	67-69%	D+
84-86%	B	64-66%	D
80-83%	B-	below 64	F
77-79%	C+		

Program Expectations

In order to make the most of the opportunities presented in program, communicate respectfully, prepare for student success, and demonstrate best possible engagement, SIT has the following expectations of students:

- **Content Considerations:** The texts and activities you will encounter in this course delve into sensitive topics that may be emotionally and intellectually challenging. Our classroom is a space where we can engage with challenging ideas, question assumptions, and navigate difficult topics with respect and maturity. As possible, I will flag content and activities that are especially graphic or intense, so we are prepared to address them soberly and sensitively. If you are struggling to keep up with the work or participate in the course because of the nature of the content and activities, you should speak with me and/or seek help from counseling services.
- **Learning Community:** Respect differences of opinion (classmates', lecturers, local constituents engaged with on the visits). You are not expected to agree with everything you hear, but you are expected to listen across differences and consider other perspectives with respect.
- **Presence.** Show up prepared. Be on time, have your readings completed and points in mind for discussion or clarification. Complying with these elements raises the level of class discussion for everyone.
- **Engage.** Ask questions in class. Interact with the lecturer. These are often very busy professionals who are doing us an honor by coming to speak.
- **Be Honest.** Comply with academic integrity policies (no plagiarism or cheating, nothing unethical).

- **Store Your Work:** Keep several copies of your work as back up and keep one copy accessible to you through an online forum, such as an attachment in your email, the course learning management system, or cloud-based storage. This way your work will always be available despite technical issues. Lost files, deleted drives, or computer crashes are not excuses for late, missing work.
- **Personal Technology Use:** Cell phones and other personal electronics can be used for taking notes and other class activities. Off-task usage is not acceptable, especially during a guest lecture or presentation from a peer. You may be marked as absent for habitually using them for something other than classroom activities.
- **Course Communication:** Course documents and assignments will be posted on the learning management system, Canvas. Although the course calendar provides a broad overview and the general sequence of work and assignments for the course, what we accomplish in class will vary, and revisions to the calendar will be posted at the course site. You will need to check the course site regularly. You are responsible for letting me know about any network-related problems that prevent you from accessing or submitting assignments.
- **Recording Policy:** To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use. Documented academic accommodations may supersede this policy.

SIT Policies and Resources

Please refer to the [SIT Study Abroad Handbook](#) and the [Policies](#) section of the SIT website for all academic and student affairs policies. Students are accountable for complying with all published policies. Of particular relevance to this course are the policies regarding: academic integrity, Family Educational Rights and Privacy Act (FERPA), research and ethics in field study and internships, late assignments, academic status, academic appeals, diversity and disability, sexual harassment and misconduct, and the student code of conduct.

Please refer to the SIT Study Abroad Handbook and SIT website for information on important resources and services provided through our central administration in Vermont, such as [Library resources and research support](#), [Accessibility Services](#), [Counseling Services](#), [Title IX information](#), and [Equity, Diversity, and Inclusion](#) resources.

Course Schedule

**Please be aware that topics and excursions may vary to take advantage of any emerging events, to accommodate changes in our lecturers' availability, and to respect any changes that would affect student safety. Students will be notified if this occurs*

Note: This course schedule is a suggested sequence of modules, topics, texts, and experiential learning opportunities where each location offers parallel learning cycles with a comparative focus. Lead and local faculty should appropriately adapt how these topics are taught and select texts, case studies, guest speakers, and site visits that are relevant to the context and course themes.

LOCATION #1: IRELAND (weeks 1-5)

Module #1: Introduction to Biodiversity and Conservation Initiatives in Europe

Topics: ecological and policy landscape of Europe, key concepts of biodiversity, ecological networks, and conservation strategies.

Readings:

- European Commission. (n.d.). The European Green Deal. Retrieved June 11, 2025, from https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
- European Commission. (2020). EU biodiversity strategy for 2030: Bringing nature back into our lives (COM(2020) 380 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0380>
- Department of Culture, Heritage and the Gaeltacht. (2023). 4th National Biodiversity Action Plan 2023–2030. National Parks and Wildlife Service. https://www.npws.ie/sites/default/files/files/4th_National_Biodiversity_Action_Plan.pdf

Learning on Location: Site visit to Special Protection Area, Cliffs of Moher

Assignment: Weekly Field Journal and Sketchbook entries

Module #2: Species Distribution, Adaptation, and Habitat Structure

Topics: Distribution patterns of mammals and birds in temperate ecosystems; adaptations to the wet, mild climate

Readings:

- Searle, J. B. (2008). The colonization of Ireland by mammals. *The Irish Naturalists' Journal*, 29(Special Supplement: Mind the Gap: Postglacial colonization of Ireland), 109–115. <http://www.jstor.org/stable/20764507>
- Gillings, S., Balmer, D. E., Caffrey, B. J., Downie, I. S., Gibbons, D. W., Lack, P. C., Reid, J. B., Sharrock, J. T. R., Swann, R. L., & Fuller, R. J. (2019). Breeding and

wintering bird distributions in Britain and Ireland from citizen science bird atlases. *Global Ecology and Biogeography*, 28(5), 644–659. <https://doi.org/10.1111/geb.12906>

- Gorman, T., Kindermann, G., & Morley, T. (2018). A rapid assessment framework for Irish habitats: A case study of machair habitat quality. *Irish Geography*, 51(2), 205–228. <https://doi.org/10.55650/igj.2018.1372>

Learning on Location: Field trip to Burren National Park,

Assignment: Weekly Field Journal and Sketchbook entries

Module# 3: Wildlife Conservation and Endangered Species

Topics: Key species conservation programs, with a focus on puffins, seals, otters, pine martens, and the white-tailed eagle

Readings:

- Gilbert, G., Stanbury, A., & Lewis, L. (2021). Birds of conservation concern in Ireland 4: 2020–2026. *Irish Birds*, 43, 1–22. <https://birdwatchireland.ie/app/uploads/2021/04/Irish-Birds-2021-BOCCI-for-web.pdf>
- Davies, J. G., Humphreys, E. M., Evans, T., Howells, R. J., Hara-Murray, R. O., & Pearce-Higgins, J. W. (2023). Seabird abundances projected to decline in response to climate change in Britain and Ireland. *Marine Ecology Progress Series*, 725, 121–140. <https://doi.org/10.3354/meps14462>
- Cronin, M. A. (2011). The conservation of seals in Irish waters: How research informs policy. *Marine Policy*, 35(6), 748–755. <https://doi.org/10.1016/j.marpol.2011.01.006>
- O'Reilly, C., Turner, P., O'Mahony, D. T., Twining, J. P., Tosh, D. G., Smal, C., McAney, K., Powell, C., Power, J., & O'Meara, D. B. (2021). Not out of the woods yet: Genetic insights related to the recovery of the pine marten (*Martes martes*) in Ireland. *Biological Journal of the Linnean Society*, 132(4), 774–788. <https://doi.org/10.1093/biolinnean/blaa214>
- Reid, N., Lundy, M. G., Hayden, B., Waterman, T., Looney, D., Lynn, D., Marnell, F., McDonald, R. A., & Montgomery, W. I. (2014). Covering over the cracks in conservation assessments at EU interfaces: A cross-jurisdictional ecoregion scale approach using the Eurasian otter (*Lutra lutra*). *Ecological Indicators*, 45, 93–102. <https://doi.org/10.1016/j.ecolind.2014.03.023>
- BirdWatch Ireland. (2019, January 15). *Life on the bog – Carrownagappul Bog* [Video]. YouTube. <https://www.youtube.com/watch?v=CPXxlxnpIq8>

Learning on Location: Field visit to The Carrownagappul Bog Special Area of Conservation in Galway

Assignment: Weekly Field Journal and Sketchbook entries

Module #4: Invasive Species and Ecological Disruption

Topics: Impact of invasive species like grey squirrels on native fauna

Readings:

- Lucy, F. E., Davis, E., Anderson, R., Booy, O., Bradley, K., Britton, J. R., Byrne, C., Caffrey, J. M., Coughlan, N. E., Crane, K., Cuthbert, R. N., Dick, J. T. A., Dickey, J. W. E., Fisher, J., Gallagher, C., Harrison, S., Jebb, M., Johnson, M., Lawton, C., Lyons, D., Mackie, T., Maggs, C., Marnell, F., McLoughlin, T., Minchin, D., Monaghan, O., Montgomery, I., Moore, N., Morrison, L., Muir, R., Nelson, B., Niven, A., O'Flynn, C., Osborne, B., O'Riordan, R. M., Reid, N., Roy, H., Sheehan, R., Stewart, D., Sullivan, M., Tierney, P., Treacy, P., Tricarico, E., & Trodd, W. (2020). Horizon scan of invasive alien species for the island of Ireland. *Management of Biological Invasions*, 11(2), 155–177. <https://doi.org/10.3391/mbi.2020.11.2.01>
- Twining, J. P., Montgomery, W. I., & Tosh, D. G. (2020). Declining invasive grey squirrel populations may persist in refugia as native predator recovery reverses squirrel species replacement. *Journal of Applied Ecology*, 57(12), 2407–2418. <https://doi.org/10.1111/1365-2664.13660>
- Caravaggi, A., Montgomery, W. I., & Reid, N. (2015). Range expansion and comparative habitat use of insular, congeneric lagomorphs: Invasive European hares (*Lepus europaeus*) and endemic Irish hares (*Lepus timidus hibernicus*). *Biological Invasions*, 17(3), 687–698. <https://doi.org/10.1007/s10530-014-0759-1>

Assignments:

- Weekly Field Journal and Sketchbook entries
- Habitat Narrative #1 due

Module #5: Climate Change and Faunal Adaptation

Topics: Climate change and its effects on migratory and resident bird species

Readings:

- Department of Housing, Local Government and Heritage. (2023, March 3). National Peatlands Strategy mid-term review and implementation plan. <https://www.gov.ie/en/publication/4c7a4-national-peatlands-strategy-mid-term-review-and-implementation-plan/>
- Arnds, P. (2020). Rewilding the world in the postcolonial age: On the nexus between cultural production and species politics. *Journal of Postcolonial Writing*, 56(4), 568–582. <https://doi.org/10.1080/17449855.2020.1764203>
- OConnell, B. (2025). Rewilding plans for a farm in Sligo. *DBS Applied Research and Theory Journal*, 2, Article 147. <https://doi.org/10.22375/dbs.v2i1.147>

Learning on Location: BioBlitz at Connemara National Park

Assignments:

- Weekly Field Journal and Sketchbook entries
- BioBlitz Team Species Inventory Sheet and Geotags in iNaturalist

LOCATION #2: SWITZERLAND (weeks 6–10)

Module #6: Species Distribution, Adaptation, and Habitat Structure

Topics: Alpine fauna adaptations to high-altitude ecosystems, range shifts

Readings:

- Federal Office for the Environment (FOEN). (2012). Swiss biodiversity strategy. Bern: Federal Office for the Environment.
<https://www.bafu.admin.ch/bafu/en/home/topics/biodiversity/publications-studies/publications/swiss-biodiversity-strategy.html>
- Vittoz, P., Cherix, D., Gonseth, Y., Lubini, V., Maggini, R., Zbinden, N., & Zumbach, S. (2013). Climate change impacts on biodiversity in Switzerland: A review. *Journal for Nature Conservation*, 21(3), 154–162. <https://doi.org/10.1016/j.jnc.2012.12.002>
- Büntgen, U., Greuter, L., Bollmann, K., Jenny, H., Liebhold, A., Galván, J. D., Stenseth, N. C., Andrew, C., & Myrsterud, A. (2017). Elevational range shifts in four mountain ungulate species from the Swiss Alps. *Ecosphere*, 8(4), e01761. <https://doi.org/10.1002/ecs2.1761>
- Schai-Braun, S. C., Jenny, H., Ruf, T., & Hackländer, K. (2021). Temperature increase and frost decrease driving upslope elevational range shifts in Alpine grouse and hares. *Global Change Biology*, 27(24), 6602–6614. <https://doi.org/10.1111/gcb.15909>

Learning on Location: Alpine ecotone hike near Mont Salève

Assignment: Weekly Field Journal and Sketchbook entries

Module #7: Wildlife Conservation and Endangered Species

Topics: Large carnivore conservation, bears, lynx, wolves

Readings:

- Breitenmoser, U. (1998). Large predators in the Alps: The fall and rise of man's competitors. *Biological Conservation*, 83(3), 279–289. [https://doi.org/10.1016/S0006-3207\(97\)00084-0](https://doi.org/10.1016/S0006-3207(97)00084-0)
- Zajec, P., Zimmermann, F., Roth, H. U., & Breitenmoser, U. (2005). The return of the Brown bear to Switzerland – Suitable habitat distribution, corridors and potential conflicts (KORA Bericht No. 28e, 31 pp.). KORA – Coordinated Research Projects on Carnivore Ecology and Wildlife Management, Switzerland
- Drouet-Hoguet, N., Chenesseau, D., Kunz, F., & Zimmermann, F. (2021). Situation of the lynx in the Jura Mountains. In *The Eurasian lynx in Continental Europe* (pp. 29–35). IUCN/SSC Cat Specialist Group. https://www.catsg.org/files/ugd/7a07e2_2ef66269a9fc49f7929ad2473f6a1088.pdf#page=29
- Cracco, M., Michel, A. H., Komossa, F., Kong, I., Backhaus, N., Thaler, L., Oliveri, T., & Walters, G. (2024). Where is the wolf? A multi-method comparison of social values and

perceptions in a Swiss park. *Wildlife Biology*, 2024(1), Article e01267.
<https://doi.org/10.1002/wlb3.01267>

Learning on Location: guest lecturer on large carnivore conservation and public attitudes

Assignment: Weekly Field Journal and Sketchbook entries

Module #8: Invasive Species and Ecological Disruption

Topics: Disruption of native habitats and food webs by invasive species

Readings:

- Haltiner, L., Zhang, H., Anneville, O., De Ventura, L., DeWeber, J. T., Hesselschwerdt, J., ... & Dennis, S. R. (2022). The distribution and spread of quagga mussels in perialpine lakes north of the Alps. *Aquatic Invasions*, 17(2), 153–173.
<https://doi.org/10.3391/AI.2022.17.2.02>
- Krieg, R., King, A., & Zenker, A. (2020). Measures to control invasive crayfish species in Switzerland: A success story? *Frontiers in Environmental Science*, 8, Article 609129.
<https://doi.org/10.3389/fenvs.2020.609129>
- Tsykun, T., Javal, M., Hölling, D., Kharouba, H. M., Müller, J., & Brockerhoff, E. G. (2019). Fine-scale invasion genetics of the quarantine pest, *Anoplophora glabripennis*, reconstructed in single outbreaks. *Scientific Reports*, 9, 19436.
<https://doi.org/10.1038/s41598-019-55698-3>
- Skendžić, S., Zovko, M., Pajač Živković, I., Lešić, V., & Lemić, D. (2021). Effect of climate change on introduced and native agricultural invasive insect pests in Europe. *Insects*, 12(11), 985. <https://doi.org/10.3390/insects12110985>

Learning on Location: BioBlitz at Parc Agro-Urbain Bernex et Confignon

Assignments:

- Weekly Field Journal and Sketchbook entries
- BioBlitz Team Species Inventory Sheet and Geotags in iNaturalist

Module #9: Climate Change and Faunal Adaptation

Topics: Climate change adaptation strategies for alpine and migratory species

Readings:

- Brambilla, M., Resano-Mayor, J., Scridel, D., Anderle, M., Bogliani, G., Braunisch, V., Capelli, F., Cortesi, M., Horrenberger, N., Pedrini, P., Sangalli, B., Chamberlain, D., Arlettaz, R., & Rubolini, D. (2018). Past and future impact of climate change on foraging habitat suitability in a high-alpine bird species: Management options to buffer against global warming effects. *Biological Conservation*, 221, 209–218.
<https://doi.org/10.1016/j.biocon.2018.03.008>

- Vitasse, Y., Ursenbacher, S., Klein, G., Bohnenstengel, T., Chittaro, Y., Delestrade, A., Monnerat, C., Rebetez, M., Rixen, C., ... & others. (2021). Phenological and elevational shifts of plants, animals and fungi under climate change in the European Alps. *Biological Reviews*, 96(5), 1816–1835. <https://doi.org/10.1111/brv.12727>
- Maggini, R., Lehmann, A., Kéry, M., Schmid, H., Beniston, M., Jenni, L., & Zbinden, N. (2011). Are Swiss birds tracking climate change? Detecting elevational shifts using response curve shapes. *Ecological Modelling*, 222(1), 21–32. <https://doi.org/10.1016/j.ecolmodel.2010.09.010>

Learning on Location: Visit Rhône River Restoration Corridor

Assignment:

- Weekly Flora Field Journal and Sketchbook entries
- Habitat Narrative #2 due

LOCATION #3: SPAIN (weeks 11–15)

Module #10: Species Distribution, Adaptation, and Habitat Structure

Topics: Animal adaptations to dry, hot climates; species of the Mediterranean maquis

Readings:

- del Río, S., Canas, R., Cano, E., Cano-Ortiz, A., Musarella, C., Pinto-Gomes, C., & Penas, A. (2021). Modelling the impacts of climate change on habitat suitability and vulnerability in deciduous forests in Spain. *Ecological Indicators*, 131, 108202. <https://doi.org/10.1016/j.ecolind.2021.108202>
- Lara-Romero, C., Virgós, E., Escribano-Ávila, G., Mangas, J. G., Barja, I., & Pardavila, X. (2012). Habitat selection by European badgers in Mediterranean semi-arid ecosystems. *Journal of Arid Environments*, 76, 43–48. <https://doi.org/10.1016/j.jaridenv.2011.08.013>
- Valera, F., Díaz-Paniagua, C., Garrido-García, J. A., Manrique, J., Pleguezuelos, J. M., & Suárez, F. (2011). History and adaptation stories of the vertebrate fauna of southern Spain's semi-arid habitats. *Journal of Arid Environments*, 75(12), 1342–1351. <https://doi.org/10.1016/j.jaridenv.2011.06.007>

Learning on Location: Field trip Sierra de Andújar Natural Park

Assignment: Weekly Field Journal and Sketchbook entries

Module #11: Wildlife Conservation and Endangered Species

Topic: Conservation of species such as European wildcat, Iberian lynx, Spanish imperial eagle

Readings:

- Mendoza-Fernández, A. J., Arnao, L., Carretero, C., Martínez-Hernández, F., & Sánchez Robles, J. M. (2023). Threatened wildlife for an instructional approach about biodiversity conservation. *Research Journal of Ecology and Environmental Sciences*, 3, 693. <https://doi.org/10.31586/rjees.2023.693>
- Gil-Sánchez, J. M., Barea-Azcón, J. M., Jaramillo, J., Herrera-Sánchez, F. J., Jiménez, J., & Virgós, E. (2020). Fragmentation and low density as major conservation challenges for the southernmost populations of the European wildcat. *PLoS ONE*, 15(1), e0227708. <https://doi.org/10.1371/journal.pone.0227708>
- Delibes-Mateos, M., Glikman, J. A., Lafuente, R., Villafuerte, R., & Garrido, F. E. (2022). Support to Iberian lynx reintroduction and perceived impacts: Assessments before and after reintroduction. *Conservation Science and Practice*, 4(2), e605. <https://doi.org/10.1111/csp2.605>
- Demerdzhiev, D., Stoychev, S., Dobrev, D., Angelov, I., & Kurtev, M. (2015). Studying the demographic drivers of an increasing Imperial Eagle population to inform conservation management. *Biodiversity and Conservation*, 24(3), 627–639. <https://doi.org/10.1007/s10531-014-0841-0>

Learning on Location: guest lecture on wildlife crime efforts, representative from Spain's administrative authorities for CITES, the special police for nature protection (SEPRONA).

Assignment: Weekly Field Journal and Sketchbook entries

Module #12: Invasive Species and Ecological Disruption

Topics: Ecological disruption caused by invasive species in Iberian ecosystems

Readings:

- Souviron-Priego, L., Muñoz, A. R., Olivero, J., Vargas, J. M., & Fa, J. E. (2018). The legal international wildlife trade favours invasive species establishment: The monk and ring-necked parakeets in Spain. *Ardeola*, 65(2), 233–246. <https://doi.org/10.13157/arla.65.2.2018.sc3>
- Gutiérrez-Zapata, S., Santoro, S., Gegundez-Arias, M. E., Selva, N., & Calzada, J. (2024). Dog invasions in protected areas: A case study using camera trapping, citizen science and artificial intelligence. *Global Ecology and Conservation*, 54, e03109. <https://doi.org/10.1016/j.gecco.2024.e03109>
- Martínez-de la Puente, J., Magallanes, S., González, M. A., Gómez-Díaz, E., Gutiérrez-López, R., & Figuerola, J. (2024). The invasive *Aedes albopictus* in the Doñana World Heritage Site. *Parasites & Vectors*, 17, 343. <https://doi.org/10.1186/s13071-024-06438-8>

Learning on Location: visit to the Metropolitan Green Corridor within La Corchuela peri-urban park

Assignment:

- Weekly Field Journal and Sketchbook entries
- Habitat Narrative #3 due

Module #13: Climate Change and Faunal Adaptation

Topic: Effects of climate change on migratory birds and amphibians

Readings:

- Alagador, D. (2022). Effective conservation planning of Iberian amphibians based on a regionalization of climate-driven range shifts. *Conservation Biology*, 36(6), e14026. <https://doi.org/10.1111/cobi.14026>
- Cano Barbacil, C., & Cano Sánchez, J. (2024). Climate change could reduce the geographic distribution of the natterjack toad in semi-arid regions: A 34-year study in central Spain. *Espacio, Tiempo y Forma. Serie VI, Geografía*, 17, 145–156. [https://doi.org/10.5944/etfvi.17.2024.41661:contentReference\[oaicite:2\]{index=2}](https://doi.org/10.5944/etfvi.17.2024.41661:contentReference[oaicite:2]{index=2})
- Ramírez, F., Rodríguez, C., Seoane, J., Figuerola, J., & Bustamante, J. (2018). How will climate change affect endangered Mediterranean waterbirds? *PLoS ONE*, 13(2), e0192702. <https://doi.org/10.1371/journal.pone.0192702>
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Learning on Location: BioBlitz at Doñana National Park

Assignments:

- Weekly Field Journal and Sketchbook entries
- BioBlitz Team Species Inventory Sheet and Geotags in iNaturalist

Module #14: Cross-Regional Comparisons

Topics: Synthesis, Comparative Analysis, Reflection

Assignment: Reflective Comparison