



**S F S** THE SCHOOL  
FOR FIELD STUDIES

# Ecological Restoration in Agricultural Landscapes

## SFS 3264

**Syllabus**  
**4 credits**

The School for Field Studies (SFS)  
Center for Sustainable Food Systems  
Greve in Chianti, Italy

This syllabus may develop or change over time based on local conditions, learning opportunities, and faculty expertise. Course content may vary from semester to semester.

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## COURSE CONTENT SUBJECT TO CHANGE

***Please note that this is a copy of a recent syllabus. A final syllabus will be provided to students on the first day of academic programming.***

SFS programs are different from other travel or study abroad programs. Each iteration of a program is unique and often cannot be implemented exactly as planned for a variety of reasons. There are factors which, although monitored closely, are beyond our control. For example:

- Changes in access to or expiration or change in terms of permits to the highly regulated and sensitive environments in which we work;
- Changes in social/political conditions or tenuous weather situations/natural disasters may require changes to sites or plans, often with little notice;
- Some aspects of programs depend on the current faculty team as well as the goodwill and generosity of individuals, communities, and institutions which lend support.

Please be advised that these or other variables may require changes before or during the program. Part of the SFS experience is adapting to changing conditions and overcoming the obstacles that may present. In other words, the elephants are not always where we want them to be, so be flexible!

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## Course Overview

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The necessity and urgency of halting and reversing the loss of biodiversity has been repeatedly called for by international organizations such as the UN, FAO, IPBES, EU, national governments and NGOs. More specifically, official strategies and reports such as the UN's Millennium Ecosystem Assessment (2005), the UN's Agenda 2030 (2015), the IPBES Global Assessment Report on Biodiversity and Ecosystem Services (2019), the FAO's Strategy on Mainstreaming Biodiversity across Agricultural Sectors (2020), the EU's Biodiversity Strategy (2020), and the UN's Kunming-Montreal Global Biodiversity Framework (2022), are defining goals, targets and actions in order to reverse the loss of biodiversity.

However, when it comes to implementing these strategies and action plans on the ground, there is the need to understand what the problems and opportunities of nature restoration at the local level are. This is particularly true for food systems in densely populated Europe, where almost no pristine natural area exists below 2000 meters of altitude. Instead of addressing the lessening/mitigating of food systems' impacts on the environment to halt the loss of biodiversity, this program is adopting a change of perspective by focusing on the understanding, analysis, and assessment of making "nature's return" sustainable for food systems. By looking at what is happening in Tuscany, students will explore the ecological, economic, and sociocultural complexities of sustainably managing natural restoration in ecosystems historically used by food systems

This interdisciplinary course explores the complex dynamics of the implementation on the ground of the vision, missions, goals and targets set up by the CBD Kunming-Montreal Global Biodiversity Framework and by the EU's Green Deal, the EU's From Field to Fork and Biodiversity Strategies and Law on Nature Restoration. In particular, the transformative targets and actions deemed necessary to achieve the overall goal of "living in harmony with nature by 2050", supposed to be initiated and completed by 2030, will be analyzed at local level in the environmental, economic and socio-cultural contexts of Tuscany. Problems and opportunities that may arise from the transformative processes of rewilding, as well as an in-depth overview of strategies, agroecological practices, policy tools and instruments available to local government, NGOs, users and other stakeholders, to manage sustainably Nature's return, will be explored. The visits to different rural communities, protected areas and seminatural and agricultural ecosystems, including vineyards and olive groves, arable lands, natural pastures, oak, beech, chestnut and pine forests, salt marshes and wetlands, in the Apennine Mountain range, Chianti hilly landscape and Maremma flat coastal areas, will enable a clear understanding of the complexities to be taken into consideration to achieve a sustainable rewilding of Tuscany.

## Learning Objectives

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Students will be able to:

- Identify the challenges and benefits of various actual situations related to "nature's return" in Tuscany, including forest expansion, the increase in wild wolf, boar and roe deer populations, and wetland restoration.
- Assess the viability of different restoration strategies, considering their impacts on ecosystem services and on farmers, shepherds, fishers, foresters, and local communities.
- Design potential management proposals and strategies for sustainable rewilding in agricultural landscapes.

## Assessment

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The evaluation breakdown for the course is as follows:

Assessment Item	Value (%)
Participation	10
Field Exercise 1	20
Field Exercise 2	20
Field Exercise 3	20
Final Exam	30
<b>TOTAL</b>	<b>100</b>

### Participation (10%)

Everybody should be prepared for each academic session. This implies reading the materials for each session with enough detail to be able to ask relevant questions, and to participate in analytical discussions about the key issues. Active participation during classes, discussions, assignments, and hikes is expected. Participation will be evaluated by looking at student's attention during classes, appropriate and timely questions and comments, contribution to teamwork and educate and respectful behavior.

### Field Exercise 1 (20%) Identifying and valuing ecosystem services at farm and agroecosystem levels

This FEX will allow students to build on what they have learned about socio-economic valuations of agroecosystem goods and services. A guided field visit will offer the opportunity to practice the identification of what are the goods and services actually or potentially delivered at the agroecosystem and farm level and what could be the most suitable monetary and non-monetary valuation techniques to highlight their socio-economic values in land use decision making processes. Students will be given instructions on how to recognize the delivery of provisioning, regulating and cultural ecosystem services through direct observation and what they have learned in previous class lectures. Student's work will be assessed based on the identification of agroecosystem goods and services delivered, development of sound hypothesis on agroecosystem and farm potentiality to deliver other goods and services, appropriateness of the valuation techniques selected and presentation of results in their written template report at the end of the field exercise.

### Field Exercise 2 (20%) Drivers, pressures, impacts, and responses to sustainable management strategies for the Orbetello lagoon

This FEX will be based on what students learned from local stakeholders during a field trip to Orbetello and class discussions of key concepts of sustainability theory. In this assignment students will work in small groups. Each group will identify the main drivers and pressures impacting the lagoon habitats and propose responses that could be used to develop a sustainable strategy for the management of the lagoon. Management strategies developed will be presented in class with a 15-minute presentation two days after the trip. Students' work will be assessed against the framing, narrative and plausibility of the strategy designed, the identification of factors and processes leading to the overall outcomes, and the assessment of the envisaged environmental, economic and social sustainability resulting from the developed management strategy.

### Field Exercise 3 (20%) Wolf Population Monitoring Techniques

This FEX will be based on a lecture on wolves monitoring techniques in the morning by national park experts and on monitoring activities of Wolf howling to be carried out at night of the same or following

day. Students will work in groups. Park experts will explain what techniques are used, what data are gathered and how these are analyzed to gather information of wolf populations numbers, density, etc. Students' work will be evaluated on their answering to questions on wolf monitoring techniques and on reporting about monitoring activities carried out in the night during the field trip at the National Park of Foreste Casentinesi, Monte Falterona, and Campigna.

### Final Exam (30%)

The final exam will be based on material covered in lectures, readings, and field experiences. It will contain three essay questions, and students can choose to answer two of them. There will be a course review session before the exam.

## Grading Scheme

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A	95.00 - 100.00%	B+	86.00 - 89.99%	C+	76.00 - 79.99%	D	60.00 - 69.99%
A-	90.00 - 94.99%	B	83.00 - 85.99%	C	73.00 - 75.99%	F	0.00 - 59.99%
		B-	80.00 - 82.99%	C-	70.00 - 72.99%		

## General Reminders

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**Honor Code/Plagiarism** – SFS places high expectations on their students and we hold students accountable for their behaviors. SFS students are held to the honor code below. SFS has a zero-tolerance policy towards student cheating, plagiarism, data falsification, and any other form of dishonest academic and/or research practice or behavior. Using the ideas or material of others without giving due credit is cheating and will not be tolerated. Any SFS student found to have engaged in or facilitated academic and/or research dishonesty will receive no credit (0%) for that activity.

*“SFS does not tolerate cheating or plagiarism in any form. While participating in an SFS program, students are expected to refrain from cheating, plagiarism and any other behavior which would result in a student receiving credit for work which they did not accomplish on their own. Students are expected to report any instance of cheating or plagiarism by others.”*

**Deadlines** – Deadlines for written and oral assignments are instated to promote equity among students and to allow faculty ample time to review and return assignments before others are due. As such, deadlines are firm; extensions will only be considered under extreme circumstances. Late assignments will incur a penalty of 10% of your grade for each day you are late. After two days past the deadline, assignments will no longer be accepted. Assignments will be handed back to students after a one-week grading period. Grade corrections for any assessment item should be requested in writing at least 24 hours after assignments are returned. No corrections will be considered afterwards.

**Content Statement** – Every student comes to SFS with unique life experiences, which contribute to the way various information is processed. Some of the content in this course may be intellectually or emotionally challenging but has been intentionally selected to achieve certain learning goals and/or showcase the complexity of many modern issues. If you anticipate a challenge engaging with a certain

topic or find that you are struggling with certain discussions, we encourage you to talk about it with faculty, friends, family, the HWM, or access available mental health resources.

**Participation** – Since we offer a program that is likely more intensive than you might be used to at your home institution, missing even one lecture can have a proportionally greater effect on your final grade simply because there is little room to make up for lost time. Participation in all components of the course is mandatory, it is important that you are prompt for all activities, bring the necessary equipment for field exercises and class activities, and simply get involved.

**AI Usage in Assignments** – SFS acknowledges the growing role of artificial intelligence (AI) tools in education and professional settings. While AI can be a valuable resource for learning and productivity, its use must align with the learning goals and integrity of each assignment. For this reason, students are encouraged to discuss the acceptable uses of AI for each assignment with the instructor. If you wish to use AI for any part of an assignment, consult with the instructor beforehand to ensure that its use adheres to the academic expectations of the course. Let’s work together to navigate this evolving landscape responsibly!

## Course Content

**Type: O:** Orientation, **D:** Discussion, **L:** Lecture, **FL:** Field Lecture, **FEX:** Field Exercise

\*Readings in **Bold** are required.

No	Title and outline	Type	Time (hrs)	Required Readings
1	<b>Course Introduction</b> Objectives, contents and structure, participation and expectations	O	1.0	
2	<b>The sharecropping system</b> Local culture, history and environment	FL	2.0	<b>Fisher et al. (2012).</b> Simoncini (2011).
3	<b>Nature and the EU's Common Agriculture Policy</b> Policy instruments for biodiversity conservation	L	1.0	<b>Cuadros-Casanova et al. (2023).</b> Guyomard et al. (2023). European Commission (2020).
4	<b>Ecosystem goods and services</b> The Millennium Ecosystem Assessment, the Economics of Ecosystems and Biodiversity, the IPBES framework	L	2.0	<b>Kumar et al. (2013).</b> Diaz et al. (2015). Millennium Ecosystem Assessment (2005). TEEB (2014).
5	<b>Economic Valuation of Ecosystem services</b> A critical review of the Total Economic Value concept and monetary valuation techniques	L	2.0	<b>Jacobs, S. et al. (2016).</b> Hahn et al., (2015).
6	<b>Podere Ruggeri Farm visit</b> Agricultural multifunctionality and the conservation of local agrobiodiversity	FL	2.0	<b>Simoncini (2015).</b> Renting et al. (2009).

No	Title and outline	Type	Time (hrs)	Required Readings
7	<b>Assessing ecosystem services delivered by an agricultural landscape</b> (see FEX 1 description)	FEX	2.0	<b>Soy-Massoni et al. (2018).</b>
8	<b>Wildlife and agriculture conflict management</b> Wild boar and roe deer in Tuscany	GL	2.0	To be decided by guest lecturer
9	<b>Farm visit in Chianti</b> Management of wild boar and roe deer	FL	2.0	<b>Batary et al., (2015).</b>
10	<b>Sustainability from theory to practice</b> MSY and Carrying Capacity, ecological thresholds and tipping points, public goods management, diversification of economic activities and climate change.	L	2.0	<b>Meyfroidt et al. (2022).</b> <b>Purvis et al. (2019).</b>
11	<b>Biodiversity conservation policy in the EU</b> EU Biodiversity Strategy, EU restoration Law, EU Natura 2000 Network	L	2.0	<b>Hodge et al. (2015).</b> Blackstock, K.L., et al. (2021). European Commission (2011).
12	<b>Visit to Orbetello Lagoon</b> Sustainability initiatives of a small artisanal fishery cooperative in the Orbetello's lagoon	FL	1.0	<b>Penca et al. (2021).</b>
13	<b>Visit to WWF Station at Orbetello lagoon</b> Biodiversity conservation and assessment of wetland habitat ecosystem services	FL	2.0	<b>Bennett et al. (2015).</b>
14	<b>Wetland habitat management for biodiversity conservation:</b> Orbetello lagoon or Burano lake (see FEX 2 description)	GL; FEX	2.0	<b>Pretty, J. (2018).</b> Ascott et al. (2021).
15	<b>Trekking San Rabano</b> Forest use from carbon production to carbon sequestration	FL	3.0	<b>Jandl R. et al. (2019).</b>
16	<b>Visit to Regional Park of Maremma</b> Wildlife and agriculture conflict management in the regional park	FL	2.0	<b>Barthel et al. (2013).</b>
17	<b>Visit to the Daccia Botrona or La trappola wetlands</b>	FL	2.0	<b>European Commission (2020).</b>
18	<b>FEX 2 presentations</b> (see FEX 2 description)	FEX	2.0	
19	<b>Forest cover and management in EU and Chianti</b>	GL	2.0	<b>Jepson P. (2018).</b>
20	<b>Visit to Foreste Casentinesi National Park</b> Guest lecturer presentation on forest management in the National Park	GL	2.0	Fernández et al. (2020).
21	<b>Wolf Populations in the National Park</b> Wolf ethology, ecology, monitoring methods	GL; FL	2.0	To be decided by guest lecturer
22	<b>Wolf Howling Monitoring</b> Wolf howling will be conducted at night. Students may be split into two groups on two different nights. Data collected will be used for FEX write up or quiz. (see FEX 3 description)	FEX	2.0	

No	Title and outline	Type	Time (hrs)	Required Readings
23	<b>Wolf/shepherds conflict management</b> The Guardian Dogs project	GL; FL	2.0	To be decided by guest lecturer
24	<b>Visit to In Quiete Acquaculture Cooperative</b>	FL	2.0	<b>Brockerhoff E.G. et al. (2017).</b> <b>Gowdy J. (2019).</b>
25	<b>Sustainable Forestry?</b> Foresta modello della montagna fiorentina or Chianti Mountains Natura 2000 sites	FL	2.0	<b>Rounsevell et al. (2019).</b>
26	<b>Course wrap up, discussion, and exam review</b>	D	2.0	
		<b>Total</b>	<b>50</b>	
		<b>UMN Instructional Hours*</b>	<b>60</b>	

\*UMN defines an instructional hour as a 50-minute block. SFS syllabi are written in full 60-minute hours for programming purposes. Therefore 50 full hours = 60 UMN instructional hours (for four credit courses) and 25 full hours = 30 UMN instructional hours (for two credit courses).

## Reading List

\*Readings in **Bold** are required

1. Ascott, M. J., Daren C. Gooddy, D. C., Owen Fenton, O., Vero, S., Ward, R. S., Basu, N. B., Fred Worrall, F., Van Meter, K., BenW. J. Surridge, B. W.J., (2021). The need to integrate legacy nitrogen storage dynamics and time lags into policy and practice, *Science of the Total Environment* 781 (2021), Elsevier
2. **Barthel, S., C. L. Crumley, and U. Svedin. (2013).** Biocultural refugia: combating the erosion of diversity in landscapes of food production. *Ecology and Society* 18(4): 71. <http://dx.doi.org/10.5751/ES-06207-180471>
3. **Batary, P., Dicks, L., Y., Kleijn, D. and Sutherland, W., J., (2015).** The role of agri-environment schemes in conservation and environmental management, *Conservation Biology*, Volume 29, No. 4, 1006–1016
4. **Bennett et al., (2015).** Biodiversity, ecosystem services and human well-being, *Current Opinion in Environmental Sustainability* 2015, 14:76–85
5. Blackstock, K.L., Novo, P., Byg, A., Creaney, R., Juarez Bourke, A., Maxwell, J.L., Tindale, S.J., Waylen, K.A., (2021). Policy instruments for environmental public goods: Interdependencies and hybridity, *Land Use Policy*, Volume 107, 2021, 104709, ISSN 0264-8377, <https://doi.org/10.1016/j.landusepol.2020.104709>
6. **Brockerhoff E. G., et al., (2019).** A rights revolution for nature, *Science* 363 (6434), 1392-1393.
7. **Cuadros-Casanova, et al. (2023).** Opportunities and challenges for Common Agricultural Policy reform to support the European Green Deal. *Conservation Biology*, 37, e14052. <https://doi.org/10.1111/cobi.14052>
8. European Commission (2011). Investing in Natura 2000: for nature and people
9. European Commission (2020). A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Brussels, 20.5.2020, COM(2020) 381 final
10. **European Commission, (2020).** The state of nature in the European Union: Report on the status and trends in 2013 - 2018 of species and habitat types protected by the Birds and Habitats Directives, COM (2020) 635 final, Brussels, 15.10.2020



11. Fernández N., Torres A., Wolf F., Quintero L., Pereira H. M., (2020). Boosting Ecological Restoration for a Wilder Europe, German Centre for Integrative Biodiversity Research (iDiv) and Martin-Luther-Universität Halle-Wittenberg, DOI: <https://dx.doi.org/10.978.39817938/57>
12. **Gowdy J., (2019).** Our hunter-gatherer future: Climate change, agriculture and uncivilization, Elsevier, <https://doi.org/10.1016/j.futures.2019.102488>
13. Hahn, T., McDermott, C., Ituarte-Lima, C., Schultz, M., Green, T., & Tuvendal, M. (2015). Purposes and degrees of commodification: Economic instruments for biodiversity and ecosystem services need not rely on markets or monetary valuation. *Ecosystem Services*, 16, 74-82. <http://dx.doi.org/10.1016/j.ecoser.2015.10.012>
14. **Hodge et al., (2015).** The alignment of agricultural and nature conservation policies in the European Union, *Conservation Biology*, Volume 29, No. 4, 996–1005, DOI: 10.1111/cobi.12531
15. **Jacobs, S., et al., (2016).** A new valuation school: Integrating diverse values of nature in resource and land use decisions, *Ecosystem Services* 22 (2016) 213–220
16. **Jandl R., Spathelf P., Bolte A., Prescott C. E., (2019).** Forest adaptation to climate change—is non-management an option?. *Annals of Forest Science* (2019) 76: 48, <https://doi.org/10.1007/s13595-019-0827-x>
17. **Jepson P. (2018).** Recoverable Earth: a twenty-first century environmental Narrative, *Ambio*, Springer.
18. **Kumar P., et al. (2013).** The economics of ecosystem services: from local analysis to national policies, *Current Opinion in Environmental Sustainability* (2013), Volume 5, Issue 1, March 2013, Pages 78-86 <http://dx.doi.org/10.1016/j.cosust.2013.02.001>
19. **Meyfroidt et al., (2022).** Ten facts about land systems for sustainability, *PNAS* 2022 Vol. 119 No. 7 e2109217118, <https://doi.org/10.1073/pnas.2109217118>
20. Millennium Ecosystem Assessment (2005). *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington DC. pp. 1-24.
21. **Penca, J., Said, A., Cavallé, M., Pita, C., Libralato, S., (2021).** Sustainable small-scale fisheries markets in the Mediterranean: weaknesses and opportunities. *Maritime Studies* (2021), Springer.
22. **Pretty, J., (2018).** Intensification for redesigned and sustainable agricultural systems, *Science* 362, eaav0294
23. **Purvis Ben, Miao Yong, Robinson Darren, (2019).** Three pillars of sustainability: in search of conceptual origins, *Sustainability Science* (2019) 14:681–695, <https://doi.org/10.1007/s11625-018-0627-5>
24. Renting, H., Rossing, W.A.H., Groot, J.C.J., Van der Ploeg, J.D., Laurent, C., Perraud, D., Stobbelaar, D.J., Van Ittersum, M.K. (2009). Exploring multifunctional agriculture. A review of conceptual approaches and prospects for an integrative transitional framework. *Journal of Environmental Management*, Elsevier
25. **Rounsevell M. D. A., Metzger M. J., Walz A., (2019).** Operationalising ecosystem services in Europe, *Regional Environmental Change*, <https://doi.org/10.1007/s10113-019-01560-1>
26. Simoncini, R. (2011). Governance objectives and instruments, ecosystem management and biodiversity conservation: the Chianti case study. *Regional Environmental Change* (2011), 11, 1, 29-44.
27. **Simoncini, R. (2015).** Introducing territorial and historical contexts and critical thresholds in the analysis of conservation of agro-biodiversity by alternative food networks, in Tuscany, Italy. *Land Use Policy*, 42, 355-366.
28. **Soy-Massoni E., Monllor N., Nuss S., Markuszewska I., and Tanskanen M., (2018).** Landscape Eaters: supporting rural development and ecosystem services delivery by eating, *Agriculture & Food*, Volume 6.
29. *The Economics of Ecosystems and Biodiversity (TEEB) for Agriculture & Food* (2014). Concept Note, 27 February 2014.