Marine Conservation Planning
SFS 3024

Syllabus
4 credits

The School for Field Studies (SFS) & Blue World Institute (BWI)
Center for the Conservation of Marine Megafauna
Veli Lošinj, Lošinj Island, Croatia

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!

Course Overview

The goal of this interdisciplinary course is to provide students with critical, applicable knowledge across biological, environmental, and social sciences, and provide practical skills of integrating knowledge into evidence-based marine conservation management. This course focusses on applying conservation science in a practical manner at both the science-society and science-policy interface.

This course introduces students to the science, the challenges and the uncertainties associated with managing and conserving marine biodiversity. It also considers the inter-related crises of biological diversity loss and climate change. The syllabus includes multiple aspects of marine conservation, especially interdisciplinary and human dimension components. Students taking this course will be able to personalize its content and focus on subjects depending on their scientific/professional interests.

The lack of professionals trained in integrated and interdisciplinary evidence-based conservation has been identified as one of the key problems in the field of marine conservation science. This course aims to provide students with the required competences to be successful marine conservation professionals through an understanding of the roles of physical/environmental, biological, and social components in shaping ecology, and human use of marine systems. Students will consider the synergistic, cumulative effects of anthropogenic stressors on marine ecosystems, and be able to quantify and critically evaluate human impacts. This course will provide training in the use of state-of-the-art tools in marine conservation research, the prioritization of decision making, building the ability to work with stakeholders and integrating multidisciplinary, evidence-based knowledge in marine conservation and marine spatial planning.

Three field trips are included in the course. The first field trip will be to the Island of Susak. A short ferry ride away this trip will involve students in determining the suitability of the beaches of Susak Island for loggerhead turtle nesting in the light of climate change in the Northern Adriatic. The aim of this trip and the exercise associated with it is to consider the current and future habitat suitability for this species. The second field trip will be to Brijuni National Park. Located off the Istrian peninsula, Brijuni islands were designated a national park in 1983. The park itself is made up a series of islands and the underwater area adjacent to the islands. The underwater area is considered to be the best persevered in the region due to the absence of exploitation for much of the park's history. As such Brijuni National Park is often promoted internationally as an example of conservation in Croatia. The field trip will involve a tour and conversations with the management team working there and consideration of the management of the Natura 2000 site surrounding the National Park. The final field trip will be to the Beli rescue center for griffon vultures on the adjacent island of Cres. The rescue center is the only registered griffon vulture rescue center in Croatia and assists in the preservation of the last 100 families of griffon vultures in Croatia. The field trip will involve understanding the principal threats to the species and the work being undertaken to conserve them and inform discussions around conservation triage.

Learning Objectives

After taking this course, students will:

1. Knowledge and understanding:
    a. Understand the linkages between biological systems, human impacts and the critical role of social science, education, and politics in marine conservation.

b. Understand anthropogenic threats to marine biodiversity and mechanisms of human impact on marine biota and ecosystems.
c. Adopt knowledge and practical skills on interdisciplinary, evidence-based, ecosystem approaches in marine conservation science.
d. Identify knowledge gaps and develop applicative studies in the field of marine conservation science by using contemporary research methods.
e. Work in interdisciplinary groups, critically evaluate different conservation solutions to threats to marine ecosystems and develop science-based conservation/management plans.

2. Reflection
    a. Students will be able to develop interdisciplinary, evidence-based conservation strategies and policies, and prioritize conservation decision making for the oceans, adopting the ecosystem approach.

3. Application
    a. This course provides students with competitive, state-of-the-art interdisciplinary knowledge and practical skills needed for a professional marine conservation scientist in the 21st Century.
    b. On completion of this course students will be able to address conservation challenges in marine ecosystems, evaluate and develop evidence-based conservation strategies, and prioritize conservation decision-making, adopting ecosystem approach.

Assessment

The evaluation breakdown for the course is as follows:

Assessment Item	Value (%)
Participation	10
Quiz	10
Group Triage Presentation	25
Group habitat suitability and conservation planning	25
Comparison paper of Brijuni National Park designation and the Cres-Lošinj Natura 2000 designation	30
TOTAL	**100**

Participation (10%)

Working in an interdisciplinary team requires that individuals contribute to group work. This includes active engagement in discussions, assignments, workshops, group projects and visits. Many in-class discussions will not be formally graded, but relevant and appropriate participation will be taken into consideration, especially discussions about the key issues of the course. There are three field trips associated with the course which will also be taken into consideration under the participation aspect.

Quiz (10%)

A short quiz will be given based on pre-course reading. Reading includes the lecture on ‘what is large in the oceans and the associated paper. The quiz will be multiple choice and short-answer and be implemented in week 2.

Group Triage Exercise 1 (25%)

Students will be divided into groups (5 groups x 4 students) to select a species of conservation concern and compete for funding. There is a limited budget for conservation and hence funding must be prioritized. Groups will be expected to make scientific, moral, and legal arguments to promote their species, including defining a defendable budget. This will then be presented to the whole class for 'funding' in a competitive exercise. This is designed to reflect the real-world components of presenting a project for funding.

Group Habitat Suitability Exercise (25%)

Coordinating with lectures from the Conservation Ecology course, students will develop a methodological framework to assess beach suitability for loggerhead sea turtle nesting on Susak Island as a case study. Groups of students will review literature, prepare a methodological outline and research to identify if a beach is a candidate for turtles to select for nesting. Students will prepare a methodological outline for field work, undertake a beach suitability evaluation and produce a four-page report including introduction, materials and methods, results, discussion, and conservation plan.

Comparison Paper (30%)

Students will prepare a short paper comparing the conservation objectives of Brijuni National Park (field trip 2 and the Cres-Lošinj Site of Community Importance (SCI – HR3000161). They will consider the scientific justification for the two sites; the implementation of legal obligations and the management authority mandates as some of the potential issues.

Grading Scheme

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

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*
	Pre-departure reading			**Moleón, et al. (2020)**
1	**Course Introduction**	O	1.0	
2	**Values & Motivation** Understanding personal motivation for conservation – a moral dilemma and icebreaker. Where do your values come from?	L	1.0	
3	**Captivity and Conservation** Conservation is often used as an excuse to maintain wild animals in captive enclosures, what are the uses of marine mammals in captivity and what are the implications for conservation?	D	1.0	**Clegg (2021)**

No	Title and outline	Type	Time (hrs)	Required Readings
4	**Film and discussion** Captivity and implications for conservation – a moral dilemma – a forthright discussion around the role of captivity and personal value systems.	D	2.0	**Muka & Zarpentine (2021)**
5	**Spatial ecology** Theoretical background on spatial ecology and the movements of marine megafauna	L	1.0	
6	**Spatial ecology** Study methods for spatial ecology and the movements of marine megafauna	L	1.0	
7	**Evolutionary Concepts** Convergent evolution and adaptations of marine megafauna	L	1.0	**Agnew (2000)**
8	**Life history traits of marine megafauna**	L	1.0	**Costa (2007)**
9	**Law of the sea and implication for conservation**	L	1.0	
10	**EU, Regional Seas conservation policy**	L	1.0	
11	**Croatian National Parks and N2K sites**	L	1.0	
12	**Conservation Triage** In the absence of endless funds for conservation, how do we make decisions about what to conserve and how do we justify those decisions?	L	1.0	**Bottrill et al. (2008)**
13	**Conservation Triage** Group selection, defining the exercise, and assessment criteria	D	0.5	
14	**Conservation Triage** Group discussions – time for groups to get together and discuss the group assignments with supervisors.	D	1.0	**Wiedenfeld et al. (2021)**
15	**Nesting beach suitability - introduction**	L	1.0	
16	**Assessing beaches for nesting suitability**	FEX	6.0	
17	**Interdisciplinary Conservation** The application of interdisciplinary skills in conservation – the designation of the Cres-Lošinj Natura 2000 site.	L	1.0	**Mackelworth et al. (2013)**
18	**MPA Role Play** Cres-Lošinj Natura 2000 site	D	1.0	
19	**Prep for excusion** Briefing for Croatian Marine National Parks and Parks of Nature including Brijuni	L	1.0	
20	**Trip to Brijuni National Park**	FL	4.0	

No	Title and outline	Type	Time (hrs)	Required Readings
21	**Quantifying population status, part 1**	L	1.0	
22	**Quantifying population status, part 2**	L	1.0	
23	**LIFE Euroturtles** – Conservation Measures	L	1.0	
24	**LIFE Delfi** – Conservation Measures	L	1.0	
25	**Fish Farm Visit**	FL	3.0	
26	**Systematic Conservation Planning** Historically protected areas have been designed ad hoc, what happens when we run systematic planning at a wider scale?	D	1.0	**Margules & Pressey (2000)**
27	**Decision Science for Conservation** Conservation is a crisis discipline, often decisions need to be made in the face of uncertainty.	L	1.0	**Soulé (1985)** **Hemming et al. (2021)**
28	**Turtle Population Status**	L	1.0	
29	**Prioritizing Population Conservation Management**	L	3.0	
30	**Boat Survey** Surveying the anthropogenic use of MPAs	FEX	3.0	
31	**Applied Conservation Planning** Knowledge Exchange and Ownership of the MPA	L	1.0	
32	**Applied Conservation Planning** MPA level - Homogeneous Workshop	D	1.0	
33	**Applied Conservation Planning** MPA level - Heterogeneous Workshop	D	1.0	
34	**Course Review**	D	0.5	
35	**Triage Group Presentations**	D	2.0	
36	**Trip to Beli Vulture Centre**	FL	2.0	
37	**Debrief & Course Wrap-up**	D	1.0	
	Total contact hours		**53**	
	UMN Instructional Hours*		**63.6**	

**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. **Ball, I.R., Possingham, H.P. and Watts, M. (2009).** Marxan and relatives: software for spatial conservation prioritisation. Spatial conservation prioritisation: Quantitative methods and computational tools, 14, pp.185-196.

2. **Bottrill, M.C., Joseph, L.N., Carwardine, J., Bode, M., Cook, C., Game, E.T., Grantham, H., Kark, S., Linke, S., McDonald-Madden, E. and Pressey, R.L. (2008).** Is conservation triage just smart decision making? Trends in ecology & evolution, 23(12), pp.649-654.

3. **Carroll, C., Rohlf, D.J. and Epstein, Y. (2022).** Mainstreaming the ambition, coherence, and comprehensiveness of the post-2020 global biodiversity framework into conservation policy. Frontiers in Conservation Science, 3, p.906699.

4. Clegg, I. L. (2021). What Does the Future Hold for the Public Display of Cetaceans?. Journal of Applied Animal Ethics Research, 3(2), 240-278. https://doi.org/10.1163/25889567-bja10023

5. **Cook, I. & Crang, M. (1995).** Doing ethnographies. Environmental Publications.

6. Fortuna, C.M., Cañadas, A., Holcer, D., Brecciaroli, B., Donovan, G.P., Lazar, B., Mo, G., Tunesi, L. and Mackelworth, P.C. (2018). Coherence of the European Union marine Natura 2000 network for wide-ranging charismatic species: a Mediterranean case study. Frontiers in Marine Science 5, 356.

7. Fortuna, C.M., Cañadas, A., Holcer, D., Brecciaroli, B., Donovan, G.P., Lazar, B., Mo, G., Tunesi, L. and Mackelworth, P.C. (2018). The coherence of the European Union marine Natura 2000 network for wide-ranging charismatic species: a Mediterranean case study. Frontiers in marine science, 5, p.356.

8. Fraschetti, S., Pipitone, C., Mazaris, A., Rilov, G., Badalamenti, F., Bevilacqua, S., Claudet, J., Carić, H., Dahl, K., D'Anna, G., Daunys, D., Frost, M., Gissi, E., Göke, C., Goriup, P., Guarnieri, G., Holcer, D., Lazar, B., Mackelworth, P. et al. (2018). Light and shade in marine conservation across European and Contiguous Seas. Frontiers in Marine Science 5, 420.

9. Hardin, G. (1968). The Tragedy of the Commons. Science, 162: 1243-1248.

10. **Hemming, V., Camaclang, A.E., Adams, M.S., Burgman, M., Carbeck, K., Carwardine, J., Chadès, I., Chalifour, L., Converse, S.J., Davidson, L.N. and Garrard, G.E. (2022).** An introduction to decision science for conservation. Conservation Biology, 36(1), p.e13868.

11. Karcher, D.B., Cvitanovic, C., van Putten, I.E., Colvin, R.M., Armitage, D., Aswani, S., Ballesteros, M., Ban, N.C., Barragán-Paladines, M.J., Bednarek, A. and Bell, J.D. (2022). Lessons from bright-spots for advancing knowledge exchange at the interface of marine science and policy. Journal of Environmental Management, 314, p.114994.

12. Katsanevakis, S., Coll, M., Fraschetti, S., Giakoumi, S., Goldsborough, D., Mačić, V. Mackelworth, P.C. et al. (2020). Twelve Recommendations for Advancing Marine Conservation in European and Contiguous Seas. Frontiers in Marine Science 7, 565968.

13. Mackelworth, P. ed. (2016). Marine transboundary conservation and protected areas. Routledge.

14. **Mackelworth, P., Holcer, D. and Fortuna, C.M. (2013).** Unbalanced governance: The Cres-Lošinj special marine reserve, a missed conservation opportunity. Marine Policy, 41, pp.126-133.

15. Mackelworth, P.C., Teff Seker, Y., Vega Fernández, T., et al. (2019). Geopolitics and marine conservation: Synergies and conflicts. Frontiers in Marine Science 6, 759.

16. **Manfredo, M., Vaske, J., Brown, P. Decker, D. & Duke, E. (2008).** Wildlife and Society: The Science of Human Dimensions. Island Press, USA. PP368.

17. **Margules, C.R. and Pressey, R.L. (2000).** Systematic conservation planning. Nature, 405(6783), pp.243-253.

18. Mascia, M., Brosius, J., Dobson, T., Forbes, B., Horowitz, L., McKean, M. & Turner, N. (2003). Conservation and the Social Sciences. Conservation Biology, 17(3): 649-650.

19. Maslow, A. (1943). A theory of human motivation. Psychological Review, 50, 370-396.

20. Maxey, I. (1999). Beyond boundaries? Activism, academia, reflexivity and research. Area, 31(3): 199-208.

21. **McClanahan, T. (2004).** The Limits to Beyond Boundaries. Aquatic Conservation: Marine & Freshwater Ecosystems, 14: 1-4.

22. **Muka, S. and Zarpentine, C. (2021).** Cetacean conservation and the ethics of captivity. Biological Conservation, 262, p.109303.

23. Sala, E., Mayorga, J., Bradley, D., Cabral, R.B., Atwood, T.B., Auber, A., Cheung, W., Costello, C., Ferretti, F., Friedlander, A.M. and Gaines, S.D. (2021). Protecting the global ocean for biodiversity, food and climate. Nature, 592(7854), pp.397-402.

24. Soulé, M.E. (1985). What is conservation biology?. BioScience, 35(11), pp.727-734.

25. Strauss, A. & Corbin, J. (1998). Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory, Second Edition. Sage Publications, London.

26. **Trouillet, B. and Jay, S. (2021).** The complex relationships between marine protected areas and marine spatial planning: Towards an analytical framework. Marine Policy, 127, p.104441.

27. Wilson, K.A., Underwood, E.C., Morrison, S.A., Klausmeyer, K.R., Murdoch, W.W., Reyers, B., Wardell-Johnson, G., Marquet, P.A., Rundel, P.W., McBride, M.F. and Pressey, R.L. (2007). Conserving biodiversity efficiently: what to do, where, and when. PLOS biology, 5(9), p.e223.