



Preventing the extinction of the Dinaric-SE  
Alpine lynx population through reinforcement  
and long-term conservation



# **Annual evaluation of indicators for assessing impacts of project actions on local economy and communities and on ecosystem functions**

*2022 Assessment*

*Action D5: Assessment of socio-economic impacts  
of the project actions on local economy and  
communities*

*Action D6: Assessment of project's impacts on  
ecosystem functions*

Bernarda Bele

Contributors of data (alphabetically): Andrej Rot, Anja Molinari Jobin, Bernarda Bele, Bojana Lavrič, Diana Žele, Hubert Potočnik, Irena Kavčič, Jakub Kubala, Magda Sindičić, Maja Sever, Manca Velkavrh, Marjeta Konec, Miha Krofel, Mihai Pop, Nina Šivec Novak, Nives Pagon, Tilen Hvala, Tomaž Berce, Tomaž Skrbinišek, Urša Fležar and Vedran Slijepčević

University of Ljubljana, Biotechnical Faculty

## Introduction

To identify and develop suitable indicators we used a participatory and reiterative process involving the members of project team discussing both our needs and practical realities such as availability of the data. Initial proposal was developed at the University of Ljubljana and was then discussed over two project team meetings. The plan is to carry out assessment repeatedly, for most indices on a yearly basis. The project team agreed also on methods by choosing the most suitable quantification tools to monitor and evaluate the chosen indices.

Assessment of socio-economic impacts and ecosystem services assessment, although carried out separately, are complementary as both connect directly to LIFE Lynx project objectives. Moreover, the concept of ecosystem condition is strongly linked to human well-being through ecosystem services. The main concept of ecosystem services is based on the general notion that ecosystems need to be in good condition to provide multiple ecosystem services. Therefore, we assess and report both together.

To develop indices to assess project's impacts on ecosystem functions we used analytical framework developed under the EU Mapping and Assessment of Ecosystems and their Services (MAES) initiative and "Assessing ecosystems and their services in LIFE projects – A guide for beneficiaries".

Assessment results can help explain better to the public and stakeholders the multiple benefits of the project and its connection not only to reaching biodiversity conservation goals but also to society and the economy with which they directly interface. As such assessment results facilitate transparent information sharing thus creating an important added value to the project.

## Assessment of socio-economic indicators

Measuring, evaluating and clearly demonstrating the impacts of conservation interventions to socio-economic environment is critical for management, accountability, and lesson learning. This is particularly important for project with substantial share of community-engaging activities or have potential to impact local livelihoods and quality of life in either positive or negative ways. LIFE Lynx project includes both elements – community-based approach to maintain high public acceptance of lynx, activities that have the potential to provide positive impacts to local livelihoods (e.g., tourism and education related activities) and lastly also increasing the number of lynx which can potentially cause damages to livestock thus negatively affecting local livelihoods.

Through assessment of socio-economic indicators LIFE Lynx project attempts to answer how the project activities have impacted social constructs and issues such as how has the project engaged public and especially key target groups (e.g., hunters, schools, farmers, public, scientific community), how has the project impacted governance systems, has it created new jobs or otherwise impacted the wellbeing of local communities.

Table 1: Fifth yearly assessment of the economic and social indicators for the project LIFE Lynx.

INDICATOR	MEASUREMENT UNIT	METHOD	CORE RELEVANT ACTIONS	BASELINE 2017	2018	2019	2020	2021	2022
<b>ECONOMIC INDICATORS</b>									
Number of livestock killed by lynx per year (DSEA)	no. attacks	compensation claim register, count	C9	7	1	1	0	2	0
Fear of financial damage due to lynx presence	% of agreement to the statement "I am afraid that increased lynx presence would cause me financial damage"	project database, count	A7, D4	-	-	3.20%	-	6,63%	-
Number of farms using electric fencing at pastures	no. Farms	SFS PLI database, count	C9	41	57	51	78	87	99
Number of "painting workshop" products sold	no. products sold	project database, count	C11	-	-	6	9	7	3
Estimated revenue from tourism activities	Income in € based on estimated spending of 80 EUR per day for overnight visitors and 20 EUR for day users	estimate	C11	-	-	3340	1620	1450	620

Number of visitors and tourists taking guided Walks/workshops linked to lynx or the project (market uptake)	cumulative no. customers	project database, count	C11			14	23	79	186
Jobs created	Full time equivalent	FTE calculated as 220 8-hour working days per year (Initial situation calculated as FTE annually working as permanent employees for the project beneficiaries on lynx-related topics when project starts), project financial reporting	all actions	3.83	8,99	19	17,99	23,77	28,38
<b>SOCIAL INDICATORS</b>									
Number of physical planners involved in training seminar	no. of experts	project database, count	C7			43	--	0	0
Number of project team members involved in communication training	No. project team members	project database, count	A8, E5	-	20	48	1	14	12
Number of damage inspectors educated	no. of damage inspectors that participated in education	project database, count	C9	0	0	8	0	0	0

Number of representatives of tourism sector and protected areas educated	no. of tourism and protected areas representatives	project database, count	C11	-	0	-	0 <sup>1</sup>	95	2
Number of participants/visitors at public events organized by the project	cumulative no. people present	project database, count, can include estimates for larger events for general public	all actions	-	580	2485	3247	4906	5785
Number of news entries published on lifelynx.eu	cumulative number of news entries / page posts	count, web page dashboard	all actions	-	56	616	1021	1366	1468
Number of single visitors to the website	cumulative no. visitors	count, Google Analytics	E6	-	8240	34452	65582	105350	140871
Number of subscribers to the Facebook	cumulative no. Subscribers	count, Facebook accounts (LIFE Lynx and Cro field blog)	E6	-	2200	8650	12115	17451	19105
Number of events with screening /number of public broadcasts for video materials (film)	cumulative no. of broadcasts /shows	project database, count	E3	-	14	52	71	71	77
Number of views of project video materials	cumulative no. of views	project database, count	???			248347	367079	418427	452069
Number of public events organised	cumulative no. events organised	project database, count	all actions	-	16	57	83	121	137

<sup>1</sup> The figure of 70 reported for this indicator in the 2020 Assessment was incorrect, as these people were actually educated in 2021. Therefore, the correct figure for 2020 is 0.

Number of local inhabitants participating in the LCG meetings	cumulative no. participants	project database, count	E1	-	30	181	211	319	389
Number of publications concerning lynx and project activities (leaflets, brochures, reports, guidelines etc.) produced, editions in different languages are reported separately	cumulative no. publications produced	project web page depository, count	A5, E1, E4, E6	-	11	33	59	69	98
Number of national management documents adopted by state authorities	cumulative no. adopted documents	national legislation depositories	A5	3	0	0	0	0	0
Number of articles or spots in the media concerning lynx and mentioning the project	cumulative no. articles and spots	project media clipping database, count (baseline includes articles published before the start of the project)	D4	2	129	354	766	1153	1403
Number of schools involved in lynx related activities	cumulative no. schools	project database, count	E4	-	0	17	17	59	70
Number of children and adolescents involved in lynx related schools activities	cumulative no. people present	project database, count, can include estimates for larger events	E4	-	0	126	486	685	1068
Number of school teachers involved in lynx project	cumulative no. people present	project database, count	E4	-	0	22	23	74	85

Number of independent events attended by project team members	cumulative no. events attended	project database, count	E5, all actions	-	45	119	147	213	311
Cumulative number of participants at workshops for preparation of national management documents	cumulative no. people present	project database, count	A5	-	NA	NA	0	0	16
Hunter involvement	cumulative no. of hunting organizations involved in reinforcement and monitoring	project database, count	A3, C3, C4,....	-	93	302	333	347	374
Number of public and private organisations (or projects) which are not partners being involved	cumulative no. of organisations / projects	project database, count	E5	-	34	133	161	478	569
Public support to maintaining lynx in SI/HR/IT (DSEA)	% favourable replies	project database, count	A7, D4	-	-	85.7	-	87,23%	-
Public support to bringing new lynx to SI/HR/IT (DSEA)	% favourable replies	project database, count	A7, D4	-	-	73.9	-	74,47%	-
Number of popular articles written by project team members	cumulative no. of articles	project database, count	all actions	-	22 <sup>2</sup>	50 <sup>2</sup>	65 <sup>2</sup>	100 <sup>2</sup>	109

<sup>2</sup> Numbers in the previous reports for this indicator were not correct. Popular articles were therefore counted again and this are the correct numbers for all the years.

Number of game management plans adjusted to ensure prey	no. of local management plans amended due to project	project database, count	C10	0	0	NA	0	0	0
Number of registered users of the geo database	cumulative no. of users	geodatabase, count	C6	-	0	0	14	58	81
Number of lynx data points in geo database	cumulative no. of data points	geodatabase, count	C6	-	0	0	7741	13756	29493
Number of police inspectors trained	cumulative no. of trained police	project database, count	C8	0	0	25	25	25	50
Contribution to science (published papers, presentations at scientific conferences)	cumulative no. of contributions	project database, count	all actions	-	0	8	9	21	49
Gender representation	cumulative share of female FTE in the project team	project financial reporting data, FTE calculated as 220 8-hour working days per year	all actions	-	49,80%	50,71%	48,80%	48,80%	49,62%
Gender representation	cumulative share of female € earned the project team	project financial reporting data, personnel expenses, FTE calculated as 220 8-hour working days per year	all actions	-	47,62%	50,54%	48,89%	47,60%	50,50%



## Assessment of biological and ecological indicators

### Main concepts

Ecosystem services include all contributions of the ecosystems and all their parts towards benefits in various human activities. Typically, ecosystem services are categorised into three main groups: (1) provisioning services (e.g. timber, food); (2) regulating and maintenance services (e.g. water purification), and (3) Cultural services such as recreation, tourism, education.

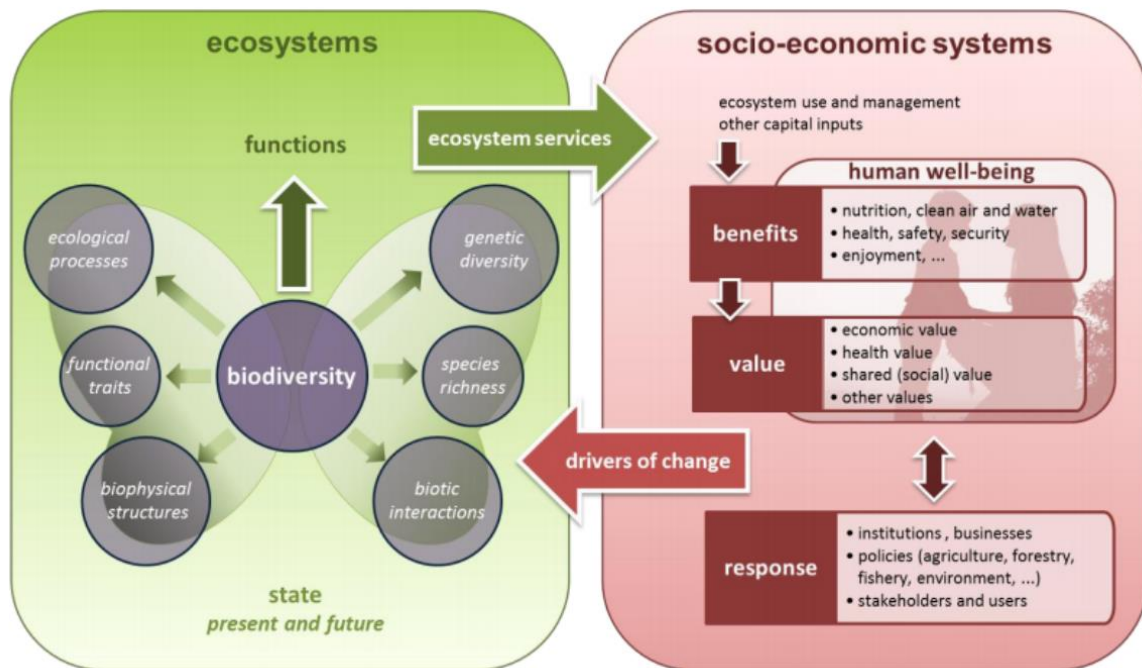


Figure 1: MAES Framework (from "Assessing ecosystems and their services in LIFE projects").

### LIFE Lynx assessment

According to MAES analytical framework LIFE Lynx project deals mainly with the "forest and woodland" ecosystem type. Following the analysis of human-environment systems we found that many of the challenges of Eurasian lynx conservation that are being address through the project are also linked with other terrestrial and more human-dominated ecosystem types such as urban, grassland and cropland ecosystem types.

Table 2: Fifth yearly assessment of biological and ecological indicators

INDICATOR	MEASUREMENT UNIT	METHOD	CORE RELEVANT ACTIONS	BASELINE 2017	2018	2019	2020	2021	2022
<b>BIOLOGICAL AND ECOLOGICAL INDICATORS</b>									
Number of threatened species	Number of individuals in the Dinaric-SE Alpine lynx population (DSEA)	estimate	C5	60	NA	72-82	110-129	98-99	93
Number of functional lynx territories	Territory occupied by male and a female (DSEA)	confirmed through genetics & camera trapping	C5	15	NA	19-20	23-26	27-29	24-27
Number of lynx reproductions	Number of annually confirmed reproductions (DSEA)	confirmed through genetics, snowtracking, direct litter observations (females on telemetry) & camera trapping	C5	5	NA	15	25	32	25
Distribution (DSEA)	km <sup>2</sup>	confirmed through genetics, snowtracking & camera trapping		6000	-	8850	9700	10200	11500
Effective population size	no.	estimated using genetics	C5	NA	-	13.4	15.4 (11.3-21.0)	NA <sup>3</sup>	26 (22-30)

<sup>3</sup> The effective population size was not assessed for 2021, as translocations would have led to incorrect estimates.

Inbreeding	Inbreeding coefficient	estimated using genetics	C5	0.3	-	0.316	0.32 (0.31 - 0.34)	0.31-0.34	0.18-0.25
Number of successfully translocated animals	Number of translocated lynx	count	C3, C4	-	0	2	5	6	2
Number of documented breeding events of the translocated animals	number of breeding events	Found litters through telemetry (females), documented using genetics (pedigree reconstruction)	C5	NA	0	1	1	5 <sup>4</sup>	7
Minimum number of lynx in the captures area in Slovakia	number of different animals	count (no. of detected individuals) and spatial capture-recapture estimates	A1	NA		13	28	24	24
Minimum number of lynx in the captures area in Romania	number of different animals	count (no. of detected individuals)	A2	-		10	11	16	24
Number of breeding events in the stepping stone area	number of confirmed breeding events	confirmed through genetics, snowtracking, direct litter observations (females on telemetry) & camera trapping	C5	-	0	0	0	1	2

<sup>4</sup> This number differs from 2021 report and was changed from 2 to 5, because we decided to count as breeding event also the kittens that were born within territories of translocated males, since the translocated males are highly likely their fathers.

Number of genetic samples collected in the project	cumulative number of collected genetic samples	count		-	100	281	442	597	754
Health status of lynx	cumulative number of examined dead lynx	count	C5	-	0	4	6	10	12



## Sources

Assessing ecosystems and their services in LIFE projects – A guide for beneficiaries

[http://ec.europa.eu/environment/life/toolkit/pmttools/life2014\\_2020/documents/life\\_ecosystem\\_services\\_guidance.pdf](http://ec.europa.eu/environment/life/toolkit/pmttools/life2014_2020/documents/life_ecosystem_services_guidance.pdf)

Mapping and Assessment of Ecosystems and their Services (MAES) -

[http://catalogue.biodiversity.europa.eu/uploads/document/file/1673/5th\\_MAES\\_report.pdf](http://catalogue.biodiversity.europa.eu/uploads/document/file/1673/5th_MAES_report.pdf)