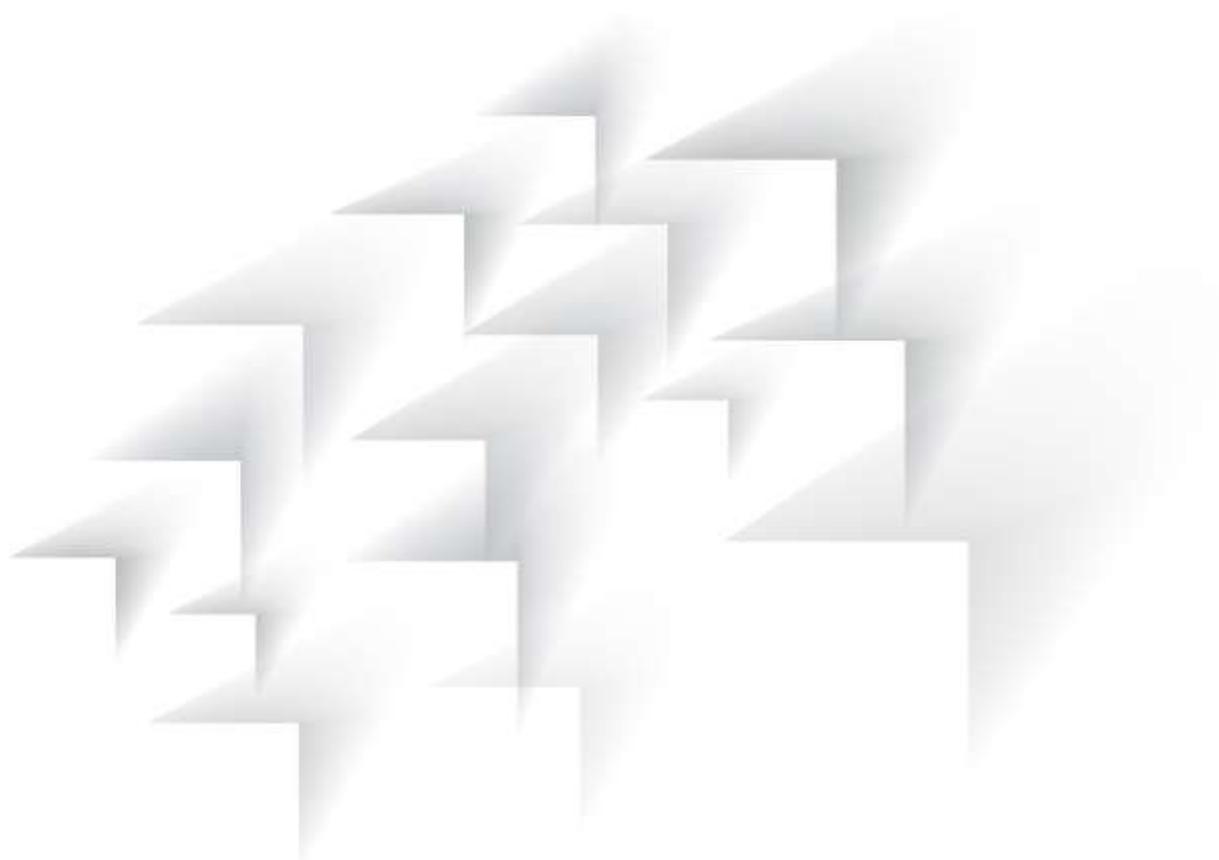




ALIGNED SUPPORT ENVIRONMENT FOR LONG-LASTING TRANSNATIONAL COOPERATION IN LYNX CONSERVATION

O.T3.2

12 2019



Ministerstvo životniho prostredia



Bayerisches Landesamt für Umwelt



ZAVOD ZA GOZDOVE SLOVENIJE



vetmeduni vienna



1. INTRODUCTION

1.1 DEFINITION OF THE SUPPORT ENVIRONMENT FOR LONG-LASTING TRANSNATIONAL COOPERATION IN LYNX CONSERVATION

With the words “support environment for long-lasting transnational cooperation in lynx conservation” we refer to:

- a) Lynx conservation capacities, that means organisations that possess an important know how and are actively involved in lynx monitoring, research, conservation and management of the Bohemian-Bavarian-Austrian, Dinaric and SE Alps lynx populations in the Czech Republic, Germany, Austria and Italy. Both project partners and institutions outside project platform are included in this list. All these institutions play an important role in lynx conservation, both on national and transnational level. The successful cooperation and connection of these many subjects in a long term is a key thing in the efficient conservation and management of transnational lynx populations.
- b) Technical equipment, that means mainly electronic devices used for monitoring of the Bohemian-Bavarian-Austrian, Dinaric and SE Alps lynx populations. The evaluation of the monitoring techniques and methods was already done as part of the O.T1.2 Transnational Toolbox for Population-Level Lynx Monitoring, in this output we summarise the equipment available and used by the 3Lynx Project organisations for current lynx monitoring and the future usage and development of this equipment.
- c) Software equipment, that means various programs and SW applications, both on-line and desktop, which are now used as a tool mainly in lynx data analysis and statistical evaluation of the development of the Bohemian-Bavarian-Austrian, Dinaric and SE Alps lynx populations. Most of these programs were developed outside project platform but are now used by 3Lynx project partners in their working routines. The only exception is a project output O.T1.1 Lynx Monitoring Database and Lynx data analysis Software, which is a SW tool developed within the project and already used by a number of project partners for storing and analysing data from Bohemian-Bavarian-Austrian lynx population.
- d) Working procedures, that means processes that are mostly already set (with the exception of LyMBO that will be started after the conservation strategy is approved) within and across countries in the area of conservation and management of the Bohemian-Bavarian-Austrian, Dinaric and SE Alps lynx populations. Some of these processes were already started before the 3Lynx Project and are mostly the same over the years, some of them were started and/or were more elaborated during the project and it is now clear that their continuation is a key thing in long-lasting and efficient

transnational cooperation in lynx conservation. The importance of every working procedure is slightly different, but generally it can be said that all these processes are very important and should be ensured also in the following years.

1.2 AIMS OF THE OUTPUT

The main aim of this output is to review and describe support environment for the conservation and management of the Bohemian-Bavarian-Austrian, Dinaric and SE Alps lynx populations in a logical, understandable manner so that also readers outside project team and even outside nature conservation community can easily understand what support environment exists in terms of personal and institutional capacities and technical equipment and what are the future plans and prospects of it all. It can serve as an information base for anyone who wants to get quickly oriented in the area of lynx conservation and management in the respective regions or it can be also valuable source of information for colleagues working with other lynx populations, who simply want to know, who does what in which country, with which equipment and how is our work organised on trans-national level. Moreover, the strategic plan is included as to what should the future development of each institution involvement, tool usage and working procedure shall be.

2. SUPPORT ENVIRONMENT FOR LONG-LASTING TRANSNATIONAL COOPERATION IN LYNX CONSERVATION

2.1 DIRECTORY OF AVAILABLE TECHNICAL SUPPORT ENVIRONMENT (CAPACITIES, SOFTWARE/IT, WORKING PROCEDURES)

This directory, which is a project deliverable D.T3.2.1, is included as Annex 1 of the Output. The directory is divided into four parts (four sheets) according to type of support environment.

In part capacities, organisations that possess an important know how and are actively involved in lynx monitoring, research, conservation and management of the Bohemian-Bavarian-Austrian, Dinaric and SE Alps lynx populations are listed, along with the description of their role, its contact persons, country and lynx population which they work on.

In part technical equipment, the owner, number of equipment, its location and country are enlisted.

In part software equipment, the name of the SW, the owner, the user and the practical usage of SW for lynx work is described.

In part working procedures, the name of the procedure, its function (reasoning), timing, region and organisations that participate in this working procedure are enlisted.

2.2 FUTURE PROSPECTS

This directory, which is a project deliverable D.T3.2.2, is included as Annex 2 of the Output. In this step, future perspectives and needs were added to the previous deliverable D.T3.2.1 and all partners committed to further harmonisation of their work. In summary, all the capacities, equipment and working procedures should be sustained, maintained and even developed in the future, for which a stable funding on a respective national level is a key issue.

3. CONCLUSIONS

The 3Lynx Project has set a very good basis for the long-lasting transnational cooperation in lynx conservation. The pilot lynx monitoring systems were launched, equipment purchased and set in field, working procedures established. This aligned support environment is now working very well and it should be an obligation of every project country to further develop it and use it for lynx conservation and management as planned in this output. For this, a political as well as financial support is needed. Therefore, based on this output, the framework of the future work with the support environment will be set in the main project Output O.T3.3 Transnational lynx conservation strategy on population level, a main strategy defining the lynx conservation policy in the region.

4. ANNEXES

ANNEX I. D.T3.2.1 Directory of available technical support environment (capacities, software/IT, working procedures)

ANNEX II. D.T3.2.2. Development plan for further alignment of support infrastructure.

Aligned support environment for long-lasting transnational cooperation in lynx conservation

Appendix I

Directory of available technical support environment (capacities, software/IT, working procedures)



D.T3.2.1 Directory of available technical support environment (capacities, software/IT, working procedures)

Name of the organisation	Contact person	Role in lynx conservation	Country	Lynx Population
SUNAP	Elisa Belotti	Lynx monitoring in the BBA central area. Trapping and rearing/breeding of injured lynxes and/or orphans from NPS part of BBA area.	CZ	BBA
ALKA Wildlife	Tereza Mináriková	Lynx monitoring in the BBA outskirts area.	CZ	BBA
Hnutí DUHA	Josefa Volfová	Lynx monitoring in the BBA outskirts area, conservation, public relations	CZ	BBA
NCA CR	Martin Strnad	Lynx monitoring in the BBA large scale protected areas of Blanský les, Český les, Slavkovský les and Brdy. Preparation of national management plan for lynx.	CZ	BBA
Animal rescue station by ZOO Ohrada	Markéta Jariabková	Trapping and rearing/breeding of injured lynxes and/or orphans from CZ part of BBA area.	CZ	BBA
University of Veterinary and Pharmaceutical	Pavel Forejtek	Autopsy of dead lynxes from Czech Republic.	CZ	BBA

Institute of Vertebrate Biology, Academy of	Jaroslava Krojerová	Genetic analysis of BBA population and also	CZ	BBA
Ministry of Environment of the Czech Republic	Jan Šíma/Simona Poláková	The upper most institution in lynx conservation in the Czech Republic, also in	CZ	BBA
South Bohemian Region	Kamil Zimmerman	Legal decisions in lynx conservation,	CZ	BBA
Pilsen Region	Jan Kroupar	Legal decisions in lynx	CZ	BBA
Slovenia Forest Service	Rok Černe	Lynx monitoring, conservation and	SI	Dinaric- SE Alpine
University of Ljubljana, Biotechnical Faculty	Tomaž Skrbinšek	Genetic analysis of SE Alpine lynx population	SI	Dinaric- SE Alpine
University of Ljubljana, Veterinary Faculty	Gorazd Vengušt	Autopsy of dead lynxes from Slovenia	SI	Dinaric- SE Alpine
Republic of Slovenia Ministry of the Environment and Spatial	Tanja Bolte	The upper most institution in lynx conservation in Slovenia, also in NATURA	SI	Dinaric- SE Alpine
University of Ljubljana, Biotechnical Faculty	Miha Krofel	Lynx monitoring and conservation	SI	Dinaric- SE Alpine
Bavarian Agency of	Manfred Wölfl	Lynx monitoring,	DE	BBA
Bavarian Ministry of Environment and	Erik Settles	Upper most institution in lynx conservation in		BBA
Federal Agency of Environment	Sandra Balzer	Representing Germany in lynx monitoring and conservation, Natura2000	DE	BBA, Harz, Rhineland-Palatinate
Federal Ministry of Environment	Rasso Leinfelder	Representing Germany in international affairs	DE	BBA, Harz, Rhineland-Palatinate
District Government of	Stefan Radlmair	Legal decisions in lynx	DE	BBA
District Government of	Eva Fischer	Legal decisions in lynx	DE	BBA
District Government of	Harald Rebhan	Legal decisions in lynx	DE	BBA

National Park Bavarian	Franz Leibl	Lynx monitoring	DE	BBA
WWF Germany	Moritz Klose	Communication about lynx	DE	BBA
Luchs Bayern e.V.	Sybill Wölfl	Lynx monitoring and	DE	BBA
FeliCITES	Volker Zimmermann	Lynx autopsy and forensics	DE	BBA
Senckenberg Institute Gelnhausen	Carsten Nowak	Lynx genetics for German lynx populations	DE	BBA, Harz, Rhineland- Palatinate
Green Heart of Europe	Thomas Engleder	Lynx monitoring,	AT	BBA
Progetto Lince Italia	Paolo Molinari	Lynx monitoring, data analyses and research,	IT	Alps
Arma dei Carabinieri	Valter Menazzi	Monitoring, conservation,	IT	Alps
Autonomous region of	Umberto Fattori	Monitoring, compensation	IT	Alps
National Wildlife Insitute	Piero Genovesi	Legal supervision of	IT	Alps
Ministry of Environment	Eugenio Duprè	Highest level institution in	IT	Alps
Regione Veneto	Sonia Calderola	Monitoring, compensation	IT	Alps
Trentino	Claudio Groff	Monitoring, compensation	IT	Alps
Alto Adige	Andreas Agreiter	Monitoring, compensation	IT	Alps
Istituto Zooprofilattico Sperimentale delle	Antonia Ricci	Necropsies	IT	SE Alpine
Government of Upper Austria, department of	Bernhard Schön	Conservation, Natura2000	AT	BBA, Alps
Government of Upper Austria, department of	Manuela Kopecky	Legal things, e.g. permission to catch,	AT	BBA, Alps
Government of Lower, department of nature	Martin Tschulik	Conservation, Natura2000	AT	BBA, Alps
Government of Lower Austria, department of	Susanne Gyenge	Legal things, e.g. permission to catch,	AT	BBA, Alps
Veterinerian University	Felix Knauer	Research, Conservation -	AT	BBA, Alps
BIOGEOMAPS	Peter Gerngross	Lynx monitoring,	AT	BBA, Alps
Habitat Wildlife Services	Kirsten Weingarth	Lynx monitoring,	AT	BBA, Alps

FIWI	Robert Behnke	Conservation and	AT	BBA, Alps
FIWI	Steve Smith	Head of Genetics Lab	AT	BBA, Alps
FIWI	Anna Kübber-Heiss	Head of Pathology (FIWI) -	AT	BBA, Alps
Upper Austrian Hunters	Christopher Böck	Hunters education,	AT	BBA, Alps
Nationalpark Kalkalpen	Christian Fuxjäger	Lynx monitoring,	AT	Alps
KORA	Christine Breitenmoser	Lynx genetics	IT	Alps

D.T3.2.1 Directory of available technical support environment (capacities, software/IT, working procedures)

Equipment	Owner	No of items	Location	Region	Comment
Camera traps	SFS	35	3Lynx project area	Slovenia	
Box traps	SFS	3	2 box traps- LPN Jelen, 1 box trap LPN Medved	Slovenia	
GPS GSM radio collars	SFS	1	SFS central unit, Ljubljana	Slovenia	
Tranquilisation equipment set (blow pipe, syringes, ...)	SFS	1	SFS central unit, Ljubljana	Slovenia	
Camera traps	Alka Wildlife	59	3Lynx project area	Czech Republic	
Camera traps	LfU	113	3Lynx project area	Germany	
Camera traps	GHE	72	3Lynx project area	Austria	
Camera traps	PLI	18	3Lynx project area	Italy	
Camera traps	SUNAP	257	3Lynx project area	Czech Republic	around 310 owned, out of which around 60 (non-3Lynx) are very old and will probably be useless for the
Camera traps	NCA CR	34	3Lynx project area	Czech Republic	
Work station to support the ongoing efforts to identify individual lynx	FIWI	1	3Lynx project area	Austria	

D.T3.2.1 Directory of available technical support environment (capacities, software/IT, working procedures)

Programme name	Owner	User organisation	Function	Region	Link
Camelot	open source	Slovenia Forest Service/PLI	software for species analysis of camera trapping pictures	Slovenia/ Italy	desktop
Slovenian- Croatian lynx database	Faculty of Veterinary Medicine Zagreb	Slovenia Forest Service, Faculty of Veterinary Medicine Zagreb	database of all lynx data gained for Dinaric population	Slovenia, Croatia	http://lynx.vef.hr/public/
BBA database	3Lynx (WWF), Lynx Project Bavaria	LFU, ALKA Wildlife and Hnutí DUHA, GHE, NCA CR	database of all lynx data gained for BBA population, also analytical tool	BBA	https://www.lynx-bba.eu
Wildbook	Wild me/open source	ALKA Wildlife	lynx identification software, prepared for Iberian lynx but currently tested for Eurasian lynx	BBA	https://lynx.wildbook.org/
Fotofalle	Lynx Project Bavaria	ALKA Wildlife, NCA CR, SUNAP, LFU	software for recording camera trapping pictures systematically	BBA	desktop
Vortex 10	Free/Chicago Zoological Society and UNESCO	ALKA Wildlife	software for population viability analysis	BBA	https://scti.tools/
Basecamp	open source	all project partners	team management software for sharing files and documents	BBA, SEA, DIN	https://3.basecamp.com
wildID	open source	GHE	pattern recognition software, originally designed for giraffs, works more/less good for lynx	BBA	https://www.dartmouth.edu/press-releases/wildlifetracking0231
Digicam	open source	SUNAP	application that provides a comprehensive set of tools for importing, managing, editing, and sharing photos and raw files	BBA	https://www.digikam.org/about/

Individual Lynx
identification
program

open source

FIWI (all partners
engaged in active
monitoring providing
data for training the
neural network)

software providing robust and exact
results for matching/non-matching
camera trap pictures of individual lynx
(at least for white flash recordings) in
order to allow quicker conclusions on
migration, dispersal, number of
individual lynx, intraspecific
interactions etc.

BBA, SEA, desktop
DIN

D.T3.2.1 Directory of available technical support environment (capacities, software/IT, working procedures)

Working procedure	Function	Timing	Organisation	Population
Analysis of dead lynxes	Dead animals are source of valuable information about the health status of the population, population threats and are also genetic samples. Therefore it is important to document, collect, analyse, and autopsy all known lynx corpses and generally to collect mortality data from all sources.	Ad hoc	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, PLI, SFS, FIWI (AT)	BBA, Dinaric-SE Alpine
Genetic analysis	Genetic data provide valuable information about genetic diversity of the population, relationships among animals and in cases of illegal killing can help identify the killed animal and prove his origin from the wild endangered population. Therefore it is necessary to gather these data by all means and ensure regular analysis of the gained samples.	Continuous process	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, PLI, SFS, FIWI (AT),	BBA, Dinaric-SE Alpine
Camera trapping	Lynx monitoring using camera traps provides the best quality data (C1) that enable identification of monitored individuals. Based on this, status of the population can be assessed on the yearly level (Lynx report). Also, information on lynx identity is important in investigation of illegal killing cases.	Continuous process	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA, PLI, SFS	BBA, Dinaric-SE Alpine
Continuous sharing and comparison of lynx photos among all organisations involved in BBA monitoring	Sharing of lynx photos for comparison/matching in a cloud (dropbox, googledrive, magentacloud, ...), by email and personally in order to identify all animals individually.	Continuous process	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA, FIWI (for individual identification program)	BBA

Population inventory workshop	Inventory of all lynx individuals recorded in a given lynx year with the goal to find matches, clean the data and get the final number of independent animals, families and juveniles, recorded in a given lynx year in the whole population.	Once a year	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA	BBA
Preparation of lynx report	Comprehensive report summarising all information about the status of the lynx population (mortality, reproduction, population size and distribution) in the given lynx year.	Once a year	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, PLI, SFS,	BBA, Dinaric-SE Alpine
Support of investigation of illegal killing cases	Based on camera trapping data or genetics data, an illegally killed lynx can be identified and/or its origin from the population can be proved. When there is a case of illegal killing, experts provide a support to the investigation led by Police, Environmental Inspectorate and /or other organisations in order to help succesful solving of lynx these cases.	Ad hoc	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA, FIWI (by forensic investigation of dead found lynx in AT), PLI, SFS	BBA, Dinaric-SE Alpine
Regular communication and cooperation with hunters and foresters	In order to ensure wide acceptance of lynx presence in the nature, a longterm, open and fair communication and cooperation with hunters and foresters is an absolute necessity.	Continuous process	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, PLI, SFS	BBA, Dinaric-SE Alpine
Meetings and workshops of the lynx expert team	Regular meetings of the whole lynx team, or the topic-related meetings in order to share information, discuss new approaches and ensure sound development in the field of lynx conservation, management and research are necessary for efficient cross-border cooperation.	Ad hoc	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA, FIWI, others	BBA
Cross border communication and cooperation of state authorities	Fast, efficient and good cross border communication and cooperation of nature conservation authorities in the area of lynx conservation and management is a key thing for conservation of transboundary lynx population.	Continuous process	MoE, LFU, SUNAP, NCA CR, LR OOE, NPBW, other state authorities	BBA, Dinaric-SE Alpine

Meetings of LyMBo (Lynx management board for BBA population)	GO representatives of AT, CR, DE. Yearly meetings to evaluate the lynx situation and the implementation of the BBA conservation strategy, based on expert recommendations and stakeholder involvement	Once a year	to be appointed	BBA
--	---	-------------	-----------------	-----



Aligned support environment for long-lasting transnational cooperation in lynx conservation

Appendix II

Development plan for further alignment of support infrastructure



D.T3.2.2 Development plan for further alignment of support infrastructure

Name of the organisation	Contact person	Role in lynx conservation	Future perspectives	Country	Lynx Population
SUNAP	Elisa Belotti	Lynx monitoring in the BBA central area. Trapping and rearing/breeding of injured lynxes and/or orphans from NPS part of BBA area.	The long-term systematic lynx camera-trapping monitoring should be continued by SUNAP within the entire area covered by National Park and Protected Landscape Area Šumava. The intensity of camera-trapping will probably have to be reduced in some monitored grid cells after the project ends, however, a minimum of 4 camera-trapping sites per 10x10km monitored grid cell should be maintained in all grid cells monitored by SUNAP. This is necessary to ensure sufficient information about population status and size, and especially document lynx reproduction events taking place in the core area (which is an important source of new animals for the outskirts of the population distribution). Funding of this monitoring should be ensured on the national level to provide yearly standard of work done.	CZ	BBA
ALKA Wildlife	Tereza Mináriková	Lynx monitoring in the BBA outskirt area.	A systematic lynx monitoring using camera trapping method should be continued by ALKA Willdife in outskirt areas in a long term, in order to a) get sufficient information about population status and size, and b) as a support to investigation of lynx illegal killing cases. Funding of this monitoring should be ensured on the national level to provide yearly standard of work done.	CZ	BBA

Hnutí DUHA	Josefa Volfová	Lynx monitoring in the BBA outskirts area, conservation, public relations	The camera-trapping should be continued by Hnutí DUHA in outskirts area in cooperation with other partners, in order to get maximum information about lynx occurrence in outskirts areas and lynx reproduction. The lynx monitoring will continue thanks to the involvement of the public involved in the project "Lynx and Wolf patrols". Funding of these activities should be ensured on the national or international level.	CZ	BBA
NCA CR	Martin Strnad	Lynx monitoring in the BBA large scale protected areas of Blanský les, Český les, Slavkovský les and Brdy. Preparation of national management plan for lynx.	As a national state administration authority in the Czech Republic, responsible for Natura 2000 surveillance and reporting, it will maintain its role in the future.	CZ	BBA
Animal rescue station by ZOO Ohrada	Markéta Jariabková	Trapping and rearing/breeding of injured lynxes and/or orphans from CZ part of BBA area.	It is expected that it will keep its role in the lynx conservation in the future too.	CZ	BBA
University of Veterinary and Pharmaceutical Sciences Brno	Pavel Forejtek	Autopsy of dead lynxes from Czech Republic.	It is expected that it will keep its role in the lynx conservation in the future too.	CZ	BBA
Institute of Vertebrate Biology, Academy of Sciences CR	Jaroslava Krojerová	Genetic analysis of BBA population and also Beskydy/Carpathian population.	It is expected that it will keep its role in the lynx conservation in the future too.	CZ	BBA

Ministry of Environment of the Czech Republic	Jan Šíma/Simona Poláková	The upper most institution in lynx conservation in the Czech Republic, also in NATURA 2000 and protected areas. Approving and implementing lynx management plan. Legal decisions in lynx conservation.	It is expected that it will keep its role in the lynx conservation in the future too.	CZ	BBA
South Bohemian Region	Kamil Zimmerman	Legal decisions in lynx conservation, management of NATURA 2000 sites for lynx in South Bohemian Region.	It is expected that it will keep its role in the lynx conservation in the future too.	CZ	BBA
Pilsen Region	Jan Kroupar	Legal decisions in lynx conservation.	It is expected that it will keep its role in the lynx conservation in the future too.	CZ	BBA
Slovenia Forest Service	Rok Černe	Lynx monitoring, conservation and management in Slovenia	A systematic lynx monitoring using camera trapping method will be continued by SFS in collaboration with local hunters.	SI	Dinaric-SE Alpine
University of Ljubljana, Biotechnical Faculty	Tomaž Skrbinšek	Genetic analysis of Dinaric-SE Alpine lynx population	Genetic analysis of Dinaric-SE Alpine lynx population will continue in the scope of other lynx related projects and national monitoring.	SI	Dinaric-SE Alpine
University of Ljubljana, Veterinary Faculty	Gorazd Vengušt	Autopsy of dead lynxes from Slovenia	All dead lynx will be analysed by the Veterinary Faculty.	SI	Dinaric-SE Alpine

Republic of Slovenia Ministry of the Environment and Spatial Planning	Tanja Bolte	The upper most institution in lynx conservation in Slovenia, also in NATURA 2000 and protected areas. Approving and implementing lynx management plan. Legal decisions in lynx conservation.	The role of the Ministry will stay the same	SI	Dinaric-SE Alpine
University of Ljubljana, Biotechnical Faculty	Miha Krofel	Lynx monitoring and conservation	Lynx telemetry and other monitoring-related research will continue in the scope of other lynx related projects	SI	Dinaric-SE Alpine
Bavarian Agency of Environment	Manfred Wölfl	Lynx monitoring, conservation and management in Bavaria		DE	BBA
Bavarian Ministry of Environment and Customer Protection	Erik Settles	Upper most institution in lynx conservation in Bavaria, further development of lynx management plan	It is expected that it will keep its role in the lynx conservation in the future too.		BBA
Federal Agency of Environment	Sandra Balzer	Representing Germany in lynx monitoring and conservation, Natura2000	Agency is working on a German wide lynx conservation strategy which will have influence on BBA population as well	DE	BBA, Harz, Rhineland-Palatinate

Federal Ministry of Environment	Rasso Leinfelder	Representing Germany in international affairs	It is expected that it will keep its role in the lynx conservation in the future too.	DE	BBA, Harz, Rhineland-Palatinate
District Government of Lower Bavaria	Stefan Radlmair	Legal decisions in lynx conservation for district region	It is expected that it will keep its role in the lynx conservation in the future too.	DE	BBA
District Government of Upper Palatinate	Eva Fischer	Legal decisions in lynx conservation for district region	It is expected that it will keep its role in the lynx conservation in the future too.	DE	BBA
District Government of Upper Franconia	Harald Rebhan	Legal decisions in lynx conservation for district region	It is expected that it will keep its role in the lynx conservation in the future too.	DE	BBA
National Park Bavarian Forest	Franz Leibl	Lynx monitoring	Lynx monitoring in the area of the 'National Park Bavarian Forest' will continue in the scope of general wildlife monitoring tasks	DE	BBA
WWF Germany	Moritz Klose	Communication about lynx conservation measures	WWF Germany will financially support lynx conservation in Bavaria by addressing specific issues like illegal killing and communication with stakeholders	DE	BBA
Luchs Bayern e.V.	Sybille Wölfl	Lynx monitoring and research, conservation, public relations	Lynx Bavaria e.V. will contribute to lynx conservation by consulting GOs and NGOs	DE	BBA
FeliCITES	Volker Zimmermann	Lynx autopsy and forensics	FeliCITES will be established as reference lab for lynx autopsy and forensics	DE	BBA

Senckenberg Institute Gelnhausen	Carsten Nowak	Lynx genetics for German lynx populations	Genetic analysis of BBA population	DE	BBA, Harz, Rhineland-Palatinate
Green Heart of Europe (GHE)	Thomas Engleder	Lynx monitoring, conservation and management in northwestern Austria	A lynx monitoring using camera trapping method should be continued by GHE in the Austrian part of BBA lynx habitat. The collaboration with local hunters should be continued. The focus should be to get good recent figures about familygroups (reproducing females) and number of independant lynx. The crossborder cooperation and lynx matching with CZ and DE should be ensured. The financing of this taskes is open, but should ensured bei national or european financing.	AT	BBA
Progetto Lince Italia	Paolo Molinari	Lynx monitoring, data analyses and research, coordination of lynx monitoring in the Italian Alps	The roles of the Italian institutions remain the same in the future.	IT	Alps
Arma dei Carabinieri	Valter Menazzi	Monitoring, conservation, management	The roles of the Italian institutions remain the same in the future.	IT	Alps
Autonomous region of Friuli Venezia Giulia	Umberto Fattori	Monitoring, compensation of damages, orphaned lynx	The roles of the Italian institutions remain the same in the future.	IT	Alps
National Wildlife Insitute (ISPRA)	Piero Genovesi	Legal supervision of conservation, research and management	The roles of the Italian institutions remain the same in the future.	IT	Alps

Ministry of Environment	Eugenio Duprè	Highest level institution in Italy regarding lynx conservation and management	The roles of the Italian institutions remain the same in the future.	IT	Alps
Regione Veneto	Sonia Calderola	Monitoring, compensation of damages, orphaned lynx	The roles of the Italian institutions remain the same in the future.	IT	Alps
Trentino	Claudio Groff	Monitoring, compensation of damages, orphaned lynx	The roles of the Italian institutions remain the same in the future.	IT	Alps
Alto Adige	Andreas Agreiter	Monitoring, compensation of damages, orphaned lynx	The roles of the Italian institutions remain the same in the future.	IT	Alps
Istituto Zooprofilattico Sperimentale delle Venezie (IZSve)	Antonia Ricci	Necropsies	The roles of the Italian institutions remain the same in the future.	IT	SE Alpine
Government of Upper Austria, department of nature conservation	Bernhard Schön	Conservation, Natura2000	The roles of the Italian institutions remain the same in the future.	AT	BBA, Alps
Government of Upper Austria, department of forest & agriculture	Manuela Kopecky	Legal things, e.g. permission to catch, transfer, release a lynx	The roles of the Italian institutions remain the same in the future.	AT	BBA, Alps

Government of Lower, department of nature protection	Martin Tschulik	Conservation, Natura2000	The roles of the Italian institutions remain the same in the future.	AT	BBA, Alps
Government of Lower Austria, department of forest & agriculture	Susanne Gyenge	Legal things, e.g. permission to catch, transfer, release a lynx	The roles of the Italian institutions remain the same in the future.	AT	BBA, Alps
Veterinarian University Vienna, FIWI	Felix Knauer	Research, Conservation Lynx in Austria	It is expected that it will keep its role in the lynx conservation in the future too.	AT	BBA, Alps
BIOGEOMAPS	Peter Gerngross	Lynx monitoring, conservation and management in northwestern Austria	It is expected that it will keep its role in the lynx conservation in the future too.	AT	BBA, Alps
Habitat Wildlife Services	Kirsten Weingarh	Lynx monitoring, conservation and management in northwestern Austria	It is expected that it will keep its role in the lynx conservation in the future too.	AT	BBA, Alps
FIWI	Robert Behnke	Conservation and management in northwestern Austria (within 3Lynx)	It is expected that it will keep its role in the lynx conservation in the future too.	AT	BBA, Alps
FIWI	Steve Smith	Head of Genetics Lab (FIWI) - Genetic analysis of provided samples in AT	It is expected that it will keep its role in the lynx conservation in the future too.	AT	BBA, Alps

FIWI	Anna Kübber-Heiss	Head of Pathology (FIWI) - Forensic investigation of dead found individuals in AT	It is expected that it will keep its role in the lynx conservation in the future too.	AT	BBA, Alps
Upper Austrian Hunters association	Christopher Böck	Hunters education, conservation	It is expected that it will keep its role in the lynx conservation in the future too.	AT	BBA, Alps
Nationalpark Kalkalpen	Christian Fuxjäger	Lynx monitoring, conservation and management in Kalkalpen region	It is expected that it will keep its role in the lynx conservation in the future too.	AT	Alps
KORA	Christine Breitenmoser	Lynx genetics	It is expected that it will keep its role in the lynx conservation in the future too.	IT	Alps

D.T3.2.2 Development plan for further alignment of support infrastructure

Equipment	Owner	No of	Location	Region	Future perspectives	Comment
Camera traps	SFS	35	3Lynx project area	Slovenia	Continue with the camera trapping in lynx presence area. Maintenance of camera traps in the field, data analyses and reporting, regular communication with stakeholders. Stolen, and errorsome camera traps should be replaced by new equipment when needed.	
Box traps	SFS	3	2 box traps-LPN Jelen, 1 box trap LPN Medved	Slovenia	The box traps will be maintained and upgraded, if needed.	
GPS GSM radio collars	SFS	1	SFS central unit, Ljubljana	Slovenia	Maintenance of equipment.The collar will be reprogrammed and replaced, if broken/lost.	
Tranquilisation equipment set (blow pipe, syringes, ...)	SFS	1	SFS central unit, Ljubljana	Slovenia	Maintenance of equipment.Consumable materials will be purchased as needed.	
Camera traps	Alka Wildlife	59	3Lynx project area	Czech Republic	Regular check and maintenance of the ALKA Wildlife camera trapping network installed in the field during the 3Lynx Project should continue in the long term after project is ended. Stolen, and errorsome camera traps should be replaced by new equipment when needed.	

Camera traps	LfU	113	3Lynx project area	Germany	LfU is responsible for monitoring of lynx in Bavaria and will therefore secure long-term monitoring of lynx in Bavaria with passive and active monitoring methods. Camera-trapping as most important and valuable monitoring method will be carried out in areas most important for lynx conservation and management.	
Camera traps	GHE	72	3Lynx project area	Austria	Maintenance of camera traps in the field, data analyses, regular communication with stakeholders. Crossborder lynx pictures matching should be ensured within BBA.	
Camera traps	PLI	18	3Lynx project area	Italy	Maintenance of camera traps in the field, data analyses and reporting, regular communication with stakeholders	
Camera traps	SUNAP	257	3Lynx project area	Czech Republic	Regular check and maintenance of at least 4 camera trapping sites per each 10x10km grid cell monitored by SUNAP (within the Šumava NP and PLA area) should be granted by SUNAP in the long term, also after the end of the project. Stolen and errorsome cameras should be replaced by well-working equipment when needed. Communication with stakeholder regarding camera trapping data should also be continued by SUNAP in the long term	around 310 owned, out of which around 60 (non-3Lynx) are very old and will probably be useless for the next season

Camera traps	NCA CR	34	3Lynx project area	Czech Republic	Continue with the camera trapping in all Protected Landscape areas. Share data and pictures to the database and communication with stakeholders.
Work station to support the ongoing efforts to identify individual lynx	FIWI	1	3Lynx project area	Austria	Data exchange with project partners actively engaged in monitoring activities to support and enhance the technical abilities to identify individual lynx automatically to support conservation

D.T3.2.2 Development plan for further alignment of support infrastructure

Programme	Owner	User	Function	Future perspectives	Region	Link
Camelot	open source	Slovenia Forest Service/PLI	software for species analysis of camera trapping pictures		Slovenia/I taly	desktop
Slovenian-Croatian lynx database	Faculty of Veterinary Medicine Zagreb	Slovenia Forest Service, Faculty of Veterinary Medicine Zagreb	database of all lynx data gained for Dinaric population		Slovenia, Croatia	http://lynx.vef.hr/public/
BBA database	3Lynx (WWF), Lynx Project Bavaria	LFU, ALKA Wildlife and Hnutí DUHA, GHE, NCA CR	database of all lynx data gained for BBA population, also analytical tool	BBA database will be used after project end. Funding has to be secured for service provider and maintenance.	BBA	https://www.lynx-bba.eu
Wildbook	Wild me/open source	ALKA Wildlife	lynx identification software, prepared for Iberian lynx but currently tested for Eurasian lynx	A cooperation between BBA and Iberian lynx teams should continue and the Wildbook SF should be prepared for usage for Lynx lynx photos and videos too. In the long term perspective, if the Wildbook works precisely in Lynx lynx identification, it could become a tool used on a daily basis by BBA, Dinaric and Alpine teams, which would spare lot of human work.	BBA	https://lynx.wildbook.org/

Fotofalle	Lynx Project Bavaria	ALKA Wildlife, NCA CR, SUNAP, LFU	software for recording camera trapping pictures systematically	Software will be offered for free for organisations and institutions which work in lynx conservation	BBA	desktop
Vortex 10	Free/Chicago Zoological Society and IUCN SSC Conservation Breeding Specialist Group	ALKA Wildlife	software for population viability analysis	PVA using Vortex program will surely remain a key statistical tool for assessing the probability of survival/extinction of the BBA population and a key tool for conservation and strategic planning.	BBA	desktop
Basecamp	open source	all project partners	team management software for sharing files and documents	Basecamp usage will be ended after the 3Lynx project ends.	BBA, SEA, DIN	https://3.basecamp.com
wildID	open source	GHE	pattern recognition software, orginally designed for giraffs, works more/less good for lynx		BBA	https://www.dartmouth.edu/press-releases/wildlifetracking02315.html
Digicam	open source	SUNAP	application that provides a comprehensive set of tools for importing, managing, editing, and sharing photos and raw files		BBA	https://www.digikam.org/about/

Individual Lynx identification program	open source	FIWI (all partners engaged in active monitoring providing data for training the neural network)	software providing robust and exact results for matching/non-matching camera trap pictures of individual lynx (at least for white flash recordings) in order to allow quicker conclusions on migration, dispersal, number of individual lynx, intraspecific interactions etc.	Robust and functioning device for camera trap image analysis of Eurasian lynx assisting/supporting annual lynx monitoring reports and conservation management planning by providing verifiable results.	BBA, SEA, DIN
--	-------------	---	---	---	---------------

D.T3.2.2 Development plan for further alignment of support infrastructure

Working process	Function	Timing	Future perspectives	Organisation	Region
Analysis of dead lynxes	Dead animals are source of valuable information about the health status of the population, population threats and are also genetic samples. Therefore it is important to document, collect, analyse, and autopsy all known lynx corpses and generally to collect mortality data from all sources.	Ad hoc	Analysis of lynx corpses is an important activity which should continue after the 3Lynx projects end and sufficient national funding should be ensured on the yearly basis for organisations who organise the collection (see column E) as well as the post mortem analyses (see Sheet 1"Lynx conservation capacities").	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, PLI, SFS, FIWI (AT)	BBA, SEA

Genetic analysis

Genetic data provide valuable information about genetic diversity of the population, relationships among animals and in cases of illegal killing can help identify the killed animal and prove his origin from the wild endangered population. Therefore it is necessary to gather these data by all means and ensure regular analysis of the gained samples.

Continuous process

In the following years, in the few years intervals, genetic data should be collected and analysed in order to gain the information about the genetic diversity of the lynx populations. If there is a population decline in the future, the genetic analysis should be performed as soon as possible to detect possible inbreeding and implement adequate conservation measures to combat inbreeding depression.

LFU, SUNAP, BBA, NCA CR, ALKA SEA Wildlife, GHE, PLI, SFS, FIWI (AT),

Camera trapping

Lynx monitoring using camera traps provides the best quality data (C1) that enable identification of monitored individuals. Based on this, status of the population can be assessed on the yearly level (Lynx report). Also, information on lynx identity is important in investigation of illegal killing cases.

Continuous process

Both BBA and SEA-Dinaric (pilot) lynx monitoring systems, launched within the 3Lynx Project, should continue to work in the following decades, because they provide key information about the BBA, SEA and Dinaric lynx populations' sizes and trends. The Habitat Directive Reporting should be based on this standardized cross-border lynx monitoring. National funding should be ensured for these monitoring systems as an obligation that stems from Habitat Directive.

LFU, SUNAP, BBA, NCA CR, ALKA SEA Wildlife, GHE, NPBW, Hnutí DUHA, PLI, SFS

<p>Continuous sharing and comparison of lynx photos among all organisations involved in BBA monitoring</p>	<p>Sharing of lynx photos for comparison/matching in a cloud (dropbox, googledrive, magentacloud, ...), by email and personally in order to identify all animals individually.</p>	<p>Continuous process</p>	<p>The data produced from both BBA and SEA-Dinaric monitoring systems should be continuously analysed in the following years in order to prepare yearly common lynx reports. The Habitat Directive Reporting should be based on these reports. Long term national funding should be ensured for this data analysis as an obligation that stems from Habitat Directive.</p>	<p>LFU, SUNAP, BBA NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA, FIWI (for individual identification program)</p>
<p>Population inventory workshop</p>	<p>Inventory of all lynx individuals recorded in a given lynx year with the goal to find matches, clean the data and get the final number of independent animals, families and juveniles, recorded in a given lynx year in the whole population.</p>	<p>Once a year</p>	<p>Also in the following years, the data produced from both BBA and SEA-Dinaric monitoring systems should be reviewed once a year to prepare yearly common lynx reports. The Habitat Directive Reporting should be based on these reports. Long term national funding should be ensured for this data analysis as an obligation that stems from Habitat Directive.</p>	<p>LFU, SUNAP, BBA NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA</p>

Preparation of lynx report Comprehensive report summarising all information about the status of the lynx population (mortality, reproduction, population size and distribution) in the given lynx year.

Once a year Yearly common lynx reports should be produced every year together by all organisations implementing the lynx monitoring from all countries sharing the respective lynx population. The Habitat Directive Reporting should be based on these reports. Long term national funding should be ensured for the preparation of these reports as an obligation that stems from Habitat Directive. This is a key activity for the efficient conservation of the three transnational lynx populations, targeted by the 3Lynx project, that should continue as a priority measure, supported by national authorities.

BBA,
SEA

Support of investigation of illegal killing cases	Based on camera trapping data or genetics data, an illegally killed lynx can be identified and/or its origin from the population can be proved. When there is a case of illegal killing, experts provide a support to the investigation led by Police, Environmental Inspectorate and /or other organisations in order to help successful solving of lynx these cases.	Ad hoc	All organisations participating in lynx monitoring should provide their data to support investigation of lynx illegal cases now and any time in the future. This support must be a long-term commitment of all GOs and NGOs who implement lynx monitoring.	LFU, SUNAP, BBA, NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA, FIWI (by forensic investigation of dead found lynx in AT)
Regular communication and cooperation with hunters and foresters	In order to ensure wide acceptance of lynx presence in the nature, a longterm, open and fair communication and cooperation with hunters and foresters is an absolute necessity.	Continuous process	The trust building and cooperation activities with a key stakeholders is a must activity in lynx conservation which has to continue also in the future. The deeper the involvement of the hunters and foresters in lynx conservation activities, the better, but it is a slow step by step process that will have to proceed for decades to really make an impact.	LFU, SUNAP, BBA, NCA CR, ALKA SEA Wildlife, GHE, PLI, SFS

Meetings and workshops of the lynx expert team	Regular meetings of the whole lynx team, or the topic-related meetings in order to share information, discuss new approaches and ensure sound development in the field of lynx conservation, management and research are necessary for efficient cross-border cooperation.	Ad hoc	The good trans-national communication, established during the project should go on, but its extent will probably strongly depend on the funding of lynx work in the respective countries and regions.	LFU, SUNAP, NCA CR, ALKA Wildlife, GHE, NPBW, Hnutí DUHA, FIWI, others	BBA
Cross border communication and cooperation of state authorities	Fast, efficient and good cross border communication and cooperation of nature conservation authorities in the area of lynx conservation and management is a key thing for conservation of transboundary lynx population.	Continuous process	Good cross border communication and cooperation of state authorities should continue also after project end regardless political or economical situation or available funding.	MoE, LFU, SUNAP, NCA CR, LR OOE, NPBW, other state authorities	BBA
Meetings of LyMBo (Lynx management board for BBA population)	GO representatives of AT, CR, DE. Yearly meetings to evaluate the lynx situation and the implementation of the BBA conservation strategy, based on expert recommendations and stakeholder involvement	Once a year	Meetings of LyMBO should be established after the CS is signed. LyMBO should be an action group working regardless political or economical situation or available funding.	to be appointed	BBA