

Evaluation of the impact of the project “Expanding the range of the lynx population in northern Poland” on the local economy

A report presenting the results of the analysis of data collected by the Project
and the results of surveys conducted in October and November 2024.

Kraków 2024



**Co-funded by
the European Union**



**Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej**

CONTENT

INTRODUCTION.....	3
DESCRIPTION OF THE STUDY.....	4
DIRECT IMPACT OF THE PROJECT.....	5
<i>EMPLOYMENT AND EXPENDITURE FROM THE PROJECT</i>	5
INDIRECT IMPACT OF THE PROJECT	6
<i>FEAR OF DAMAGE</i>	6
<i>LOCAL TOURISM, PROMOTION OF THE REGION, REGIONAL PRODUCTS AND SERVICES</i>	10
<i>INDICATORS OF LOCAL TOURISM IN THE STUDIED REGION</i>	13
CONCLUSIONS.....	14



Co-funded by
the European Union



Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej

INTRODUCTION

The contemporary nature conservation must respond to a wide spectrum of challenges, going beyond the field of ecology, taking into account social and economic needs and problems. On the one hand, conservation activities are expected to be tailored to local socio-ecological conditions, supporting (rather than hindering) the development of local communities. On the other hand, they are increasingly seen as a necessity for satisfying certain human needs, such as contact with nature, access to a clean environment, food and opportunities for authentic experiences in nature. The benefits that nature provides to society are not limited to the extraction and sale of natural resources, or to the market for services such as tourism and education. A number of benefits that humans derive from nature are non-market in nature. These include cultural values, referring to the role of nature in traditions, customs and local identity; spiritual, aesthetic and recreational values, signifying the role of the natural world in enabling people to take a break from work through recreation and the enjoyment of wildlife; and the regulatory processes taking place in ecosystems so that we live in a clean and safe environment. These benefits are only indirectly reflected by economic processes, such as the volume of tourism and sales of tourism services, public spending on health care, or cultural activity and consumption of cultural products.

The conservation of large carnivores faces a particularly difficult challenge of accomplishing its tasks while providing social and economic benefits. The presence of large carnivores such as lynxes is often, in the public's mind, associated with damage and threats to people - even if, in reality, damage caused by lynxes occurs sporadically and is marginal compared to other protected species in Poland. The result of the perceived possibility of harm can be a lack of acceptance of conservation projects and the emergence of social conflicts, making it difficult, for example, to implement conservation measures. The benefits that society can derive from the presence of lynx in the environment, on the other hand, are very unobvious and do not appear “spontaneously” with the appearance and increase in the population of these animals. Institutions and individuals involved in lynx conservation must actively and thoughtfully build the potential of the benefits of the species' presence for local communities, often also showing and teaching how they can be realized in practice. Particularly challenging in such efforts is the fact that lynxes are animals that, on the one hand, are difficult to observe in the environment, and on the other hand, can nevertheless arouse intense emotions among residents and stakeholders.

This report presents a baseline (ex-ante) analysis for assessing the impact of the Project “Expanding the range of the lynx population in northern Poland” on the local economic environment in the municipalities where Project implementation has begun. This assessment



took into account selected areas of the Project's economic impact, both the measurable ones, possible to analyze in financial terms, and the indirect ones, related to activities and effects that may favor or hinder the economic activity of local communities. Thus, the analysis includes indicators of measurable market transactions made by the Project, a diagnosis of needs to counteract damage caused by lynx, and conditions for the development of the local tourism sector. Recognizing the importance of the broader economic significance of wildlife, the impact of the Project was also described in the context of the needs of concerns and needs of local communities related to the presence of lynxes and the activity of local residents in the local market for tourism services.

DESCRIPTION OF THE STUDY

The report assesses the baseline and needs for the project's direct and indirect impact on the local economy of municipalities in northern Poland and partner regions in Germany and Lithuania where lynx are present or will be introduced into the environment under the project. The direct impact of the project on the local economy is measured on the basis of data on project employment and purchases carried out, verifying the share of employment and purchases carried out in local economic entities. The indirect impact of the project is measured on the basis of 1) selected results of a survey conducted among stakeholders in November 2024, 2) results of structured telephone interviews conducted among those who operate agritourism facilities in the project area, and on the basis of 3) statistical office data on tourism.

Details of the stakeholder survey methodology are described in the report on the project's impact on local communities. Data from the stakeholder survey used in assessing the project's impact on local economies relate to opinions about the threats posed by the presence of lynx, the impact of the experience of harm caused by lynx on attitudes and opinions about the species, and the possibility of using the presence of lynx to promote the region, local tourism.

The structured telephone interviews were carried out on the basis of a pre-prepared questionnaire with six questions. They were conducted in November 2024. The question asked during the interview concerns the importance of local wildlife and lynxes for tourism, as well as tourists' demand for information about lynxes.

The state of the local market for tourism services has been described on the basis of indicators of the Local Data Bank of the Central Statistical Office (CSO), reported at the local level (NUT 5).



DIRECT IMPACT OF THE PROJECT

EMPLOYMENT AND EXPENDITURE FROM THE PROJECT

One year after the start, the project employs 18 people, all from the local communities of the project (Table 1). Expenditures in the project, as of 30/09/2024, totaled 754312.31 PLN (purchase of equipment and other costs, excluding travel and contracted work), of which 33% (249656.30 PLN) were implemented among local suppliers (in the municipalities of Trzcianka, Mirosławiec, Walcz, Drawsko Pomorskie).

Tab. 1. Share of the project employees from local societies.

PL: Udział osób ze społeczności lokalnej wśród zatrudnionych w projekcie.

LT: Vietos bendruomenės atstovų dalyvavimas tarp projekte dirbančių asmenų.

DE: Beteiligung von Personen aus der lokalen Gemeinschaft unter den Beschäftigten des Projekts.

Partner	Employment in the project in 2024 <i>PL: Zatrudnienie w projekcie w 2024 roku</i> <i>LT: Numatomas užimtumas 2024 m.</i> <i>DE: Projizierte Beschäftigung im Jahr 2024</i>	Share of local society among employed project staff <i>PL: Udział społeczności lokalnej wśród zatrudnionych</i> <i>LT: Darbuotojų dalyvavimas bendruomenės veikloje</i> <i>DE: Beteiligung der Arbeitnehmer an der Gemeinschaft</i>
Zachodniopomorskie Towarzystwo Przyrodnicze	11	100%
Rewilding Oder Delta	3	100%
Nadlesnictwo Spychowo	1	100%
Ecosystems Protection Centre	3	100%



Co-funded by
the European Union



Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej

INDIRECT IMPACT OF THE PROJECT

FEAR OF DAMAGE

The project has the potential to indirectly affect the local economy in terms of recognizing risks and counteracting the occurrence of damage caused by lynx, particularly those with economic consequences for local farmers and ranchers. In the completed stakeholder survey, in an open-ended question about the risks associated with the presence of lynx in the environment, the most frequently mentioned answer was a reduction in the number of deer, including often in the context of hunting in general and difficulties for hunting. The possibility of attacks on livestock was mentioned by 41% of respondents, accounting for 26% of responses. Some of these responses, however, were phrased in a way that downplayed the problem, using terms such as “some neighbor's hen will flop,” “and maybe some goose will get hunted, nothing more.”

In our stakeholder sample, 28 people (9% of respondents, including 13 people from Poland, 12 from Lithuania and 3 from Germany) said they had personally experienced harm caused by lynxes. Those who had experienced damage had statistically significantly less positive attitudes toward lynxes than the other respondents (mean attitude of 3.7, compared to 4.1 for the other respondents; Leven's test, $F=8.752m$, $p<0.05$; Fig. 1) and were more likely than the other respondents to indicate that wild animals were important to them (the question did not specify attitude or emotional attitude toward wild animals; $F=3.802$, $p<0.05$; Fig. 2). Also, those who had experienced harm had less positive attitudes toward restoring lynx to the environment (66% of respondents in this group) than the other respondents (85% of indications among the other respondents; $f=9.4548$, $p<0.05$); were less likely to expect a serious approach to lynx conservation in their country (51% vs. 86% of the others, $F=12.405$, $p<0.05$); and saw less need to educate the public about lynxes (74% vs. 92% of the others, $F=16.160$, $p<0.05$). On the other hand, those who experienced harm did not differ from the rest of the respondents in terms of their basic knowledge about lynxes, perceived benefits to tourism and promotion of local products and services.

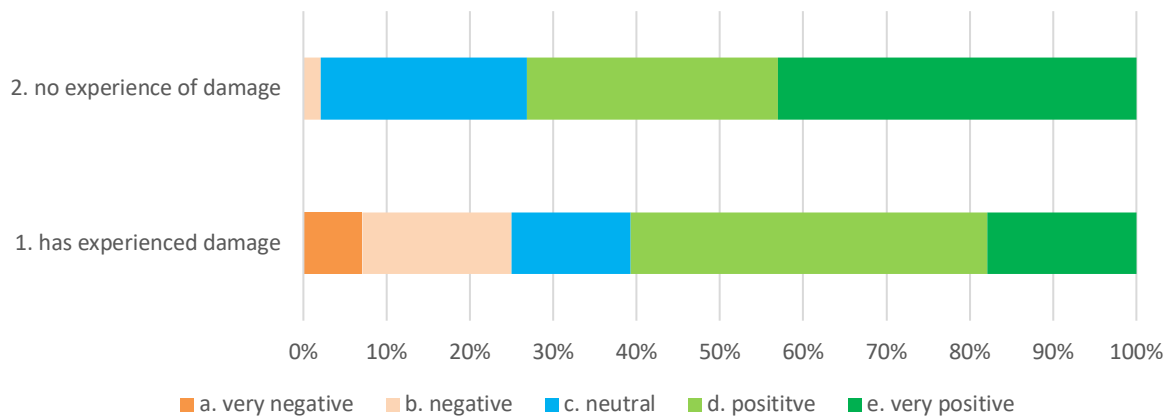


Co-funded by
the European Union



Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej

Fig. 1. What are your feelings towards lynxes?



PL: Jakie są Pana(i) uczucia wobec ryśi? a: bardzo negatywne; b: negatywne; c: neutralne; d: pozytywne; e: bardzo pozytywne; 1. osoba, która doświadczyła szkody; 2. osoba, która nie doświadczyła szkody

LT: Kokie Jūsų jausmai lūšių atžvilgiu? a: labai neigiami; b: neigiami; c: neutralūs; d: teigiami; e: labai teigiami; 1. asmuo, kuris patyrė žalą; 2. asmuo, kuris žalos nepatyrė

DE: Was ist Ihre persönliche Haltung zu Luchsen? a: sehr negativ; b: negativ; c: neutral; d: positiv; e: sehr positiv; 1. die Person, die den Schaden erlitten hat; 2. die Person, die den Schaden nicht erlitten hat

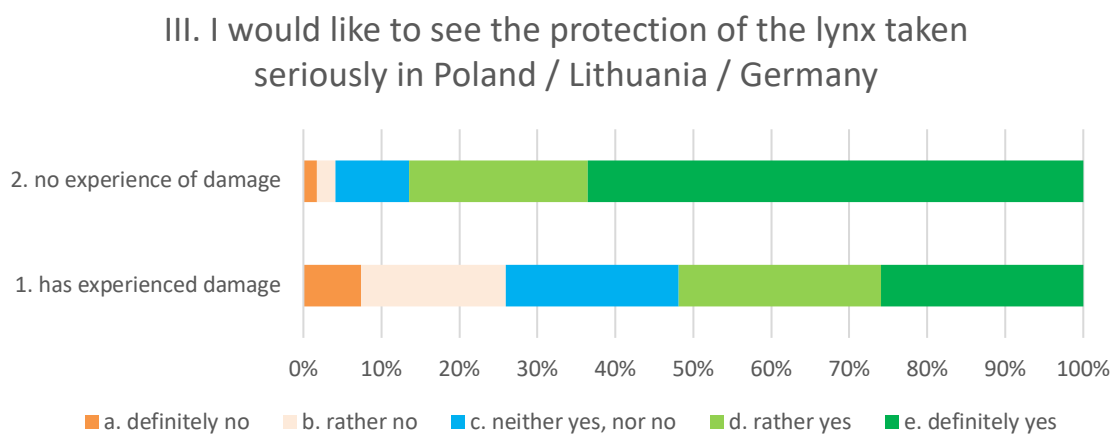
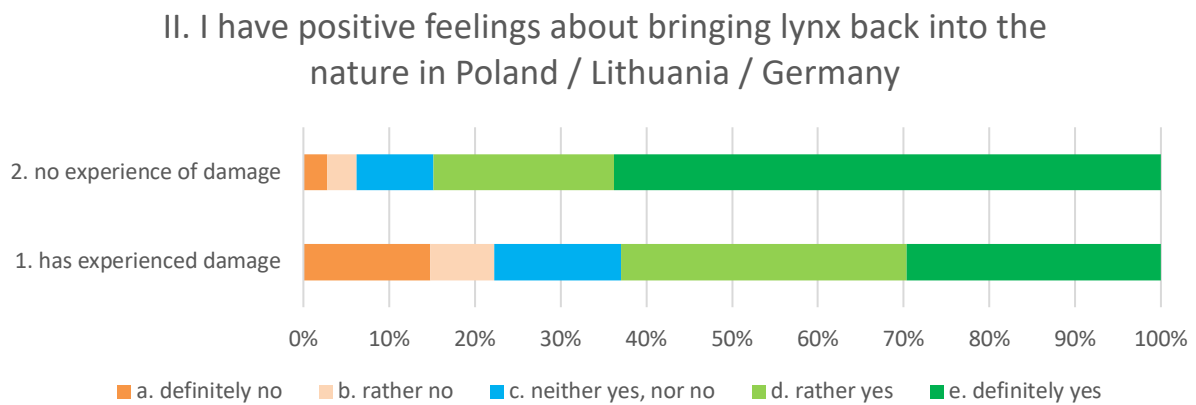
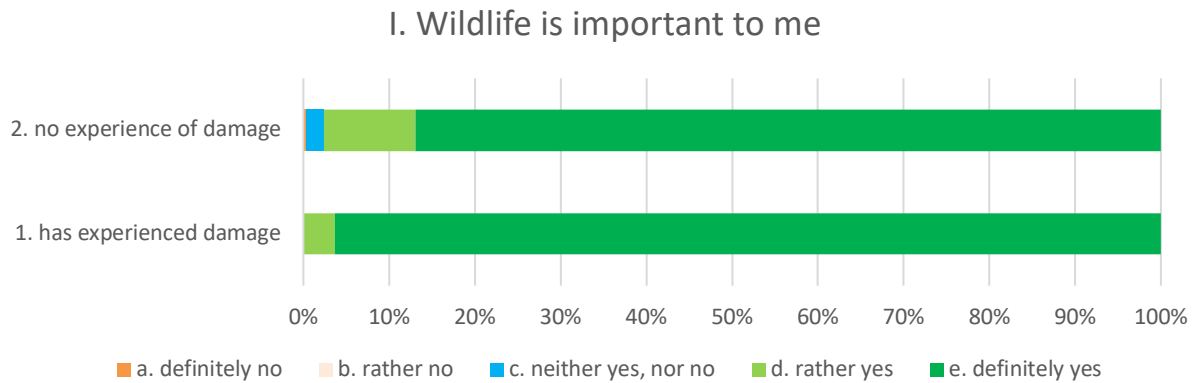


Co-funded by
the European Union

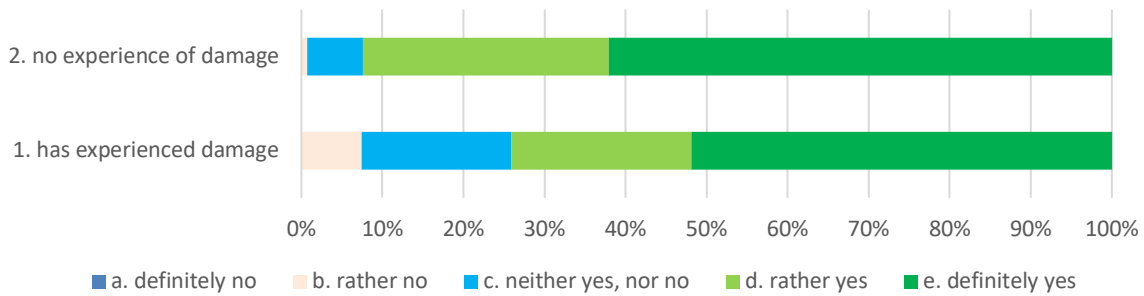


Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej

Fig. 2. Selected attitudes towards lynx that differ significantly between people who have personally experienced damage from lynx and people who have not.



IV. People should know more about lynx in northern Poland / southern Lithuania / north-east Germany



PL: Wybrane postawy wobec rysia, które różnią się istotnie statystycznie między osobami, które osobiście doświadczyły szkód wyrządzonych przez rysie, a osobami, które ich nie doświadczyły.

I: Dzika przyroda jest dla mnie ważna; II: Mam pozytywne uczucia wobec przywracania rysia do środowiska w Polsce; III: Chcę, aby ochrona rysia była poważnie traktowana w Polsce; IV: Ludzie powinni więcej wiedzieć o rysiach w Polsce

a: zdecydowanie nie; b: raczej nie; c: ani tak, ani nie; d: raczej tak; e: zdecydowanie tak.

1. osoba, która doświadczyła szkody; 2. osoba, która nie doświadczyła szkody

LT: Pasirinktas požiūris į lūšis, kuris reikšmingai skiriasi tarp žmonių, asmeniškai patyrusių lūšių daromą žalą, ir žmonių, kurie jos nepatyrė.

I: Man svarbi laukinė gamta; II: Teigiamai vertinu lūšių sugrąžinimą į Lietuvos aplinką; III: Norėčiau, kad į lūšių apsaugą Lietuvoje būtų žiūrima rimtai; IV: Žmonės turėtų daugiau žinoti apie lūšis pietų Lietuvoje

a: Tikrai ne; b: Veikiausiai Ne; c: Nei taip, nei ne; d: Veikiausiai taip; e: Tikrai taip

1. asmuo, kuris patyrė žalą; 2. asmuo, kuris žalos nepatyrė

DE: Ausgewählte Einstellungen zum Luchs, die sich signifikant unterscheiden zwischen Personen, die persönlich von Luchsen geschädigt wurden, und Personen, die dies nicht erlebt haben.

I: Wildtiere sind wichtig für mich; II: Ich stehe der Wiederansiedlung von Luchsen in der Natur in Deutschland positiv gegenüber; III: Ich will, dass der Schutz des Luchses in Deutschland ernst genommen wird; IV: Menschen sollten mehr über Luchse in Deutschland wissen

a: Eindeutig nein; b: Eher nein; c: Weder ja noch nein; d: Eher ja; e: Eindeutig ja.

1. die Person, die den Schaden erlitten hat; 2. die Person, die den Schaden nicht erlitten hat



Co-funded by
the European Union



Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej

LOCAL TOURISM, PROMOTION OF THE REGION, REGIONAL PRODUCTS AND SERVICES

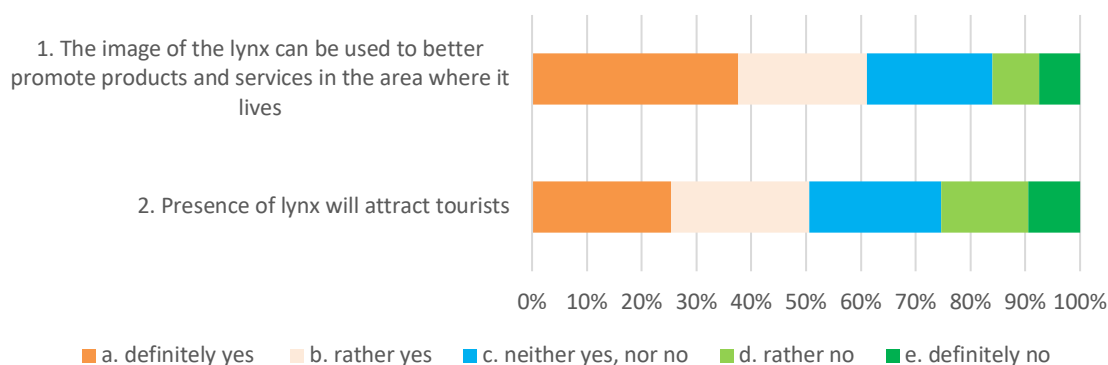
Nature tourism is one of the opportunities to support the local economy through activities in nature conservation. According to stakeholders, tourism and promotion of the region is an important benefit associated with the presence of lynx in the environment, which 10% of respondents (19 people) mentioned in response to an open question. In addition, most respondents saw potential in promoting local products and services using the image of the lynx (60% of indications definitely yes and rather yes), and half of the respondents believed that the presence of lynxes would attract tourists (50%; Fig. 4).

Among the survey respondents were 33 people (10% of the respondents) making profits from offering tourism services, including room rentals. Of these, only 4 people (1% of respondents) identified profits from tourism as their main source of income. Those making any profits from tourism were not statistically significantly different from the other respondents in terms of attitudes toward lynxes, level of knowledge about lynxes, opinions about the role of lynxes in increasing the tourist attractiveness of the region, or the potential for better sales of local products thanks to the image of lynxes.

An additional 20 structured interviews were conducted with people operating agritourism facilities in northwestern Poland. According to all the interviewed people who run agritourism facilities, nature is an important factor in attracting tourists to their facilities, and tourists visit their facilities to spend time in nature (Fig. 5). According to those running agritourism facilities, their clients are interested in the wildlife living in the area and generally have access to information about the surrounding nature. However, when asked about lynxes, only two people (10% of respondents) said that it happens that tourists ask about lynxes and that they have access to information about them. Among the facilities surveyed, all those located in Wałcz and Drawsko districts (6) responded that the Wild Homestead in Jablonowo is an interesting tourist attraction for customers of their facilities.



Fig. 4. Perception of the role of lynx in promotion of the region and fostering tourism.



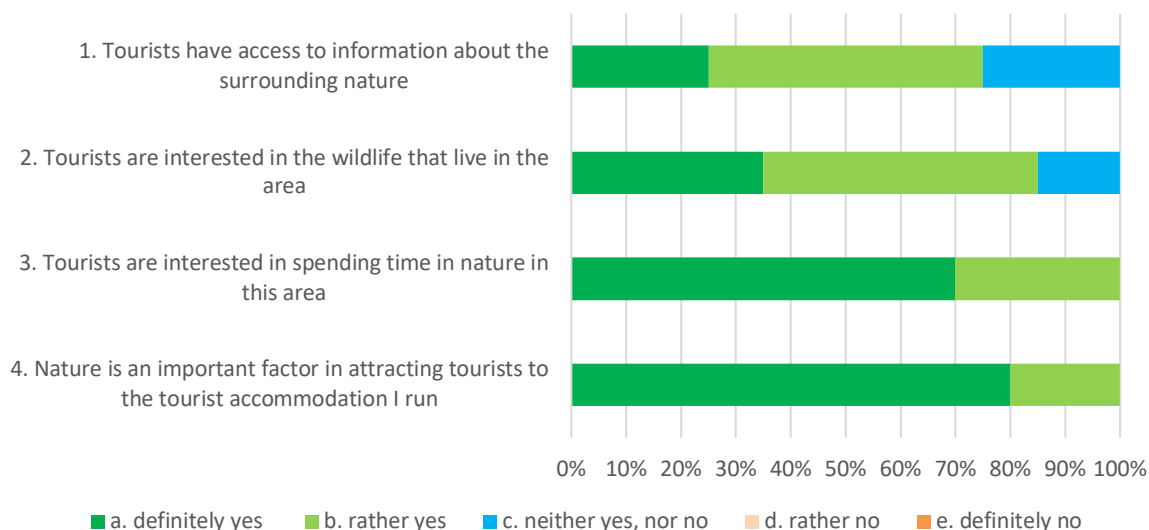
PL: Postrzeganie roli rysia w promocji regionu i wspieraniu turystyki. 1: Wizerunek rysia może być wykorzystany do lepszego promowania produktów i usług na terenie jego występowania; 2: Obecność rysia przyciągnie turystów
a: zdecydowanie tak; b: raczej tak; c: ani tak, ani nie; d: raczej nie; e: zdecydowanie nie.

LT: Ryčių vaidmens suvokimas populiarinant regioną ir skatinant turizmą. 1: Lūšies įvaizdis gali būti naudojamas geriau reklamuoti produktams ir paslaugoms jos paplitimo teritorijoje; 2: Lūšys pritrauks turistų
a: Tikrai taip; b: Veikiau taip; c: Nei taip, nei ne; d: Veikiau ne; e: Tikrai ne

DE: Wahrnehmung der Rolle des Luchses bei der Werbung für die Region und der Förderung des Tourismus. 1: Das Bild des Luchses kann genutzt werden, um Produkte und Dienstleistungen in seinem Verbreitungsgebiet zu bewerben; 2: Die Anwesenheit von Luchsen wird Touristen anziehen
a: Eindeutig ja; b: Eher ja; c: Weder ja noch nein; d: Eher nein; e: Eindeutig nein.



Fig. 5. The opinion of agrotourism owners on the role of nature and lynx in promoting local tourism.



PL: *Opinia właścicieli gospodarstw agroturystycznych na temat roli przyrody i rysia w promocji lokalnej turystyki.*

1. Turyści mają dostęp do informacji na temat okolicznej przyrody; 2. Turyści są zainteresowani dzikimi zwierzętami, które żyją w tych okolicach; 3. Turyści są zainteresowani spędzaniem czasu na łonie przyrody w tych okolicach; 4. Przyroda jest istotnym czynnikiem przyciągającym turystów prowadzonego przeze mnie obiektu

a: zdecydowanie tak; b: raczej tak; c: ani tak, ani nie; d: raczej nie; e: zdecydowanie nie.

LT: *Agroturizmo savininkų nuomonė apie gamtos ir lūšių vaidmenį skatinant vietinį turizmą.*

1: Turistai gali gauti informacijos apie supančią gamtą; 2: Turistai domisi šioje vietovėje gyvenančia laukine gamta; 3: Turistai šiose vietovėse nori praleisti laiką gamtoje; 4: Gamta yra svarbus veiksnys, pritraukiantis turistus į mano valdomą objektą.

a: Tikrai taip; b: Veikiau taip; c: Nei taip, nei ne; d: Veikiau ne; e: Tikrai ne

DE: *Die Meinung von Agrotourismusbesitzern über die Rolle von Natur und Luchs bei der Förderung des lokalen Tourismus.*

1: Touristen haben Zugang zu Informationen über die umliegende Natur; 2: Touristen interessieren sich für die Wildtiere, die in diesem Gebiet leben; 3: Touristen sind daran interessiert, in diesen Gebieten Zeit in der Natur zu verbringen; 4: Die Natur ist ein wichtiger Faktor, um Touristen in die von mir betriebene Einrichtung zu locken

a: Eindeutig ja; b: Eher ja; c: Weder ja noch nein; d: Eher nein; e: Eindeutig nein.



Co-funded by
the European Union



Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej

INDICATORS OF LOCAL TOURISM IN THE STUDIED REGION

The tourism market conditions in the municipalities with lynxes in northwestern Poland were also analyzed. These are 46 municipalities of the Zachodniopomorskie Voivodeship, 9 municipalities of the Wielkopolskie Voivodeship and 5 municipalities of the Lubuskie Voivodeship. The analysis is made on the basis of the Central Statistical Office's indicators of tourist traffic at the municipality level: registered tourist accommodation facilities, places in accommodation facilities, foreign tourists admitted and the dynamics of accommodation places.

Despite the high natural attractiveness of the studied regions and the potential for tourism development (according to the opinions of stakeholders and surveyed owners of agritourism facilities), most of the municipalities included in the project have only single accommodation facilities registered with the statistical office (Table A1). Individual municipalities differ in the number of available accommodations, as well as in the number of foreign tourists received. The dynamics of accommodations is not high. In 2022, compared to 2021, in the surveyed municipalities of Wielkopolska and Zachodniopomorskie voivodeships, there was an increase in the number of beds, while in the municipalities of Lubuskie voivodeships, there was a decrease. In the municipalities of the Lubuskie and Greater Poland provinces, the number of beds fell in 2023 compared to 2022, while in the West Pomeranian province it remained close to the number in the previous year. The number of municipalities that welcomed more foreign tourists in 2023, compared to the previous year, and the number of municipalities in which the number of foreign tourists decreased, are roughly equally distributed.

It should be taken into account that the project municipalities are not the most touristic municipalities in their provinces, the tourism sector is still developing in them and is below the regional average.



**Co-funded by
the European Union**



**Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej**

CONCLUSIONS

- The project has an important role to play in moderating the impact of increasing the lynx population on the economy, through direct (through employment and purchases) and indirect (promoting potential benefits, addressing risks) measures.
- It is worth establishing partnerships with other local third sector entities (NGOs, foundations), as well as cultural institutions.
- The workshops planned in the project should target groups vulnerable to damage, often sharing concerns about the presence of lynx. First and foremost these should be ranchers and farmers, but also hunters.
- Although damage caused by lynxes in the project area will be rare, it is worth monitoring their appearance in cooperation with the relevant regional conservation authorities.
- In the educational offer, it is worth including as a target group people offering services in the tourism sector. The project can increase the knowledge of such people about lynxes and support the use of lynx presence to increase the tourist attractiveness of the region.



Co-funded by
the European Union



Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej

A1. Tourist activity in the project municipalities, data from the Central Statistical Office, Local Data Bank.

PL: Ruch turystyczny w gminach objętych projektem, dane Głównego Urzędu Statystycznego, Bank Danych Lokalnych.

LT: Turizmo aktyvumas projekto savivaldybėse, Centrinės statistikos tarnybos duomenys, Vietinių duomenų bankas.

DE: Touristische Aktivitäten in den Projektgemeinden, Daten des Statistischen Zentralamtes, Lokale Datenbank.

Administration unit <i>PL: Jednostka administracyjna LT: administracijos padalinys DE: Verwaltungseinheit</i>	Accommodation facilities and places <i>PL: Obiekty noclegowe i miejsca noclegowe LT: Paslaugos ir apgyvendinimas DE: Einrichtungen und Unterkünfte</i>						Foreign tourists <i>PL: turyści zagraniczni LT: užsienio turistai DE: ausländische Touristen</i>		Accommodation dynamics <i>PL: dynamika miejsc noclegowych LT: Apgyvandinimo dinamika DE: Dynamik der Unterbringung</i>	
	No. of facilities			No. of accommodation available			No. of tourists		Annual change rate	
	2022	2023	2024	2022	2023	2024	2022	2023	2022	2023
LUBUSKIE	257	253	266	16 922	16 007	17 930	124 797	145 149	96,4	104,8
Santok	1	1	2	45	45	61	23	4	60,0	100,0
Dobiegniew	3	2	4	266	166	292	395	693	92,2	87,8
Strzelce Krajeńskie	6	5	5	175	198	178	236	565	100,0	82,2
WIELKOPOLSKIE	581	582	593	40 140	40 449	40 633	229 574	261 045	102,5	100,2
Czarnków	1	0	0	45	0	0	54	0	93,3	0,0
Krzyż Wielkopolski	5	5	5	133	151	151	190	285	250,0	100,0
Trzcianka	3	3	3	176	176	176	1 016	456	100,0	100,0
Wieleń	2	1	1	43	19	20	146	19	97,7	44,2
Piła	8	8	8	772	735	739	6 794	7 561	131,4	94,3
Szydłowo	1	1	1	15	15	15				
Powiat złotowski	8	8	8	363	408	369	197	164	90,6	96,6
Tarnówka	2	2	2	59	52	52	93	83	98,3	88,1
ZACHODNIOPOMORSKIE	1 397	1 421	1 465	143 289	146 784	153 732	728 102	810 870	101,2	107,1
Karlino	0	1	1	0	122	98	0	131		
Choszczno	2	1	1	112	22	42	0	9	84,6	100,0
Drawno	6	6	6	237	242	340	140	101	105,4	100,0
Pełczyce	1	0	1	20	0	20	75	46	100,0	0,0
Czaplinek	16	16	16	1 202	1 210	1 147	647	765	131,7	100,5
Drawsko Pomorskie	6	6	6	260	240	215	593	823	61,0	103,0
Kalisz Pomorski	1	2	3	162	290	309	3 813	4 514	91,0	109,9



Co-funded by
the European Union



Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej

Wierzchowo	1	1	1	20	20	20			100,0	100,0
Złocieniec	11	10	11	771	778	1 053	967	1 232	119,6	82,7
Maszewo	1	1	1	112	112	112			100,0	100,0
Nowogard	3	3	3	250	266	262	3 671	3 793	99,2	106,4
Gryfino	3	3	3	196	196	196	453	558	81,1	103,7
Gościno	3	3	4	314	311	348	78	39		
Manowo	1	2	2	284	311	318	93	173	79,9	100,0
Świeszyno	1	1	1	111	111	126	1 089	1 456	117,0	93,1
Stargard	6	5	8	317	295	478	2 412	1 259	100,0	100,0
Chociwel	1	1	1	62	62	98	248	334		
Dobrzany	1	2	2	100	120	120	86	88		
Dolice	1	2	2	30	89	89	9	8	100,0	296,7
Ińsko	2	2	2	168	168	168	0	163		
Marianowo	1	1	1	22	22	51	358	194	62,9	100,0
Stargard	2	2	2	66	66	66	104	146	100,0	100,0
Barwice	1	1	1	130	130	130	104	0	100,0	100,0
Borne Sulinowo	2	1	1	82	22	14	69	28	44,9	100,0
Świdwin	2	2	2	340	306	344	69	28	177,8	100,0
Brzeżno	1	1	1	13	13	13			100,0	100,0
Połczyn-Zdrój	7	6	7	476	288	326	185	478	138,4	68,0
Świdwin	1	1	1	15	15	15	56	2	100,0	100,0
Wałcz	6	6	6	575	567	565	517	410	74,8	98,3
Człopa	3	1	1	122	12	14	554	120	618,8	0,0
Mirosławiec	5	5	4	207	211	192	412	298	117,4	100,0
Tuczno	3	3	3	176	148	155	240	40	35,3	49,1
Łobez	3	4	4	114	128	128	359	497	90,5	112,3
Resko	1	1	1	30	30	30	2	0		
Węgorzyno	2	2	2	118	219	118	0	38		



Co-funded by
the European Union



Narodowy Fundusz
Ochrony Środowiska
i Gospodarki Wodnej