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REGIONAL PROGRAMME OF CONSERVATION AND RESTITUTION OF *SORBUS TORMINALIS* IN THE TERRITORY OF THE REGIONAL DIRECTORATE OF THE STATE FORESTS IN PIŁA IN 2010-2013

REGIONALNY PROGRAM OCHRONY I RESTYTUCJI JARZĘBU BREKINII
(*SORBUS TORMINALIS*) NA OBSZARZE DZIAŁANIA REGIONALNEJ DYREKCJI
LASÓW PAŃSTWOWYCH W PIŁE W LATACH 2010-2013

Summary. The paper presents the principles of the Programme of Conservation and Restitution of *Sorbus torminalis* in The Regional Directorate of the State Forests (RDLP) in Piła in 2010-2013. The inventory made in 2008 showed the occurrence of 3977 individuals of *S. torminalis* distributed in seven forest districts. The Programme comprises both *in situ* and *ex situ* measures. *In situ* activities concern all sites with *S. torminalis* and include mainly thinning out of tree stands, and promotion and protection of natural regeneration. *Ex situ* measures consist in introduction of the species in new sites within 19 forest districts, using the reproductive material originated from two most numerous and valuable populations – Kaczory and Krucz. Further it was decided to include also population from Krzyż to *ex situ* programme as a source of reproductive material but only for the forest district Krzyż.

Key words: trees, *Sorbus torminalis*, conservation, genetic resources, *in situ* and *ex situ* measures

Introduction

The wild service tree (*Sorbus torminalis* (L.) Crantz) is a typical forest tree species with scattered distribution. In Poland it occurs as a companion species mainly in deciduous forests in its western regions. *Sorbus torminalis* is a valuable biocenotic species which increases the biodiversity of forests. It is a rare species in Poland, protected by law since 1946 (BEDNORZ 2010).

The protection of genetic resources of forest tree species is an important issue for European foresters (CONSERVATION... 2005). Currently, in Poland, among other things, the programme of protection and restitution of two rare and endangered forest tree species: *Abies alba* (BARZDAJN 1999, 2000, 2007) and *Taxus baccata* (ISZKUŁO 2007), has been implemented in state-owned forests.

The aim of this study was to present the principles of the Programme of Conservation and Restitution of *Sorbus torminalis* in the territory of The Regional Directorate of the State Forests (RDLP) in Piła in 2010-2013. General guidelines of protection of genetic resources of *S. torminalis* were elaborated before both for Europe – within EU-FORGEN programme (DEMASURE-MUSCH and ODDOU-MURATORIO 2004), and for Poland (BEDNORZ 2007, 2009).

Resources and conditions of occurrence of *Sorbus torminalis* in the study area

A preliminary stage of the proposed Programme consisted in a precise inventory of *S. torminalis* populations and individuals within the area of RDLP Piła, which was made by forest districts. The inventory was conducted in 2008 and its results showed the occurrence of 3977 individuals of *S. torminalis* distributed in seven forest districts (Fig. 1): Kaczory – 2400 individuals (64 mature trees), Krucz – 1531 individuals (714 mature trees), Krzyż – 17 trees, Durowo – 13 trees, Złotów – 10 young individuals, Wałcz – 3 trees, Trzcianka – 3 trees. Also bearing fruits were noted during the inventory.

Most of the inventoried trees grow in managed forests. Only the population from Zielonagóra forestry area (forest district Kaczory), partly occur within the protected area of the nature reserve ‘Zielona Góra’. In the territory of RDLP Piła, *S. torminalis* occupies the habitats typical for the species – deciduous fresh and mixed fresh forests on brown and rusty soils. Most often, the species is a component of oak-hornbeam and oak forests.

Strategy of conservation and restitution of *Sorbus torminalis*

The presented Programme comprises both *in situ* and *ex situ* activities.

In situ measures, which are considered to be the most important for protection of genetic resources of *S. torminalis*, were planned for all localities. They include: thinning out of tree stands to ensure good growth, abundant flowering and fruiting of *S. torminalis* trees; promotion and protection of natural regeneration by creating gaps in the canopy, removal of seedlings of other species and if necessary fencing the regeneration of wild service tree to protect it against browsing damage. It was settled that *in situ* activities should be fulfilled in 2011 except for the forest districts Kaczory and Krucz, which have the most numerous populations covering larger areas, and the forest district Krzyż, in which during supplementary inventory in 2010 few new mature trees and many seedlings were found. In these districts *in situ* activities need to be spread in time. In spring 2011 three plots with abundant natural regeneration of *S. torminalis* in the forest district Krzyż were fenced. This population seems to portend well for the future. The complete list of *in situ* activities on individual sites were determined in details but are not presented here.



Fig. 1. Distribution of *Sorbus torminalis* in the territory of The Regional Directorate of the State Forests in Piła

Rys. 1. Rozmieszczenie jarzębu brekinii (*Sorbus torminalis*) na terenie działania Regionalnej Dyrekcji Lasów Państwowych w Pile

It was initially established that populations from Kaczory (forestry Zielonagóra) and Krucz (forestry Goraj), located in III Nature and Forest Region (MROCZKIEWICZ 1952), gave possibilities to obtain seeds for artificial reproduction in forest nurseries. The populations of *S. torminalis* in these two forest districts were previously genetically examined, and both have revealed a high level of genetic polymorphism (BEDNORZ et AL. 2006). In autumn 2009 after getting an appropriate permission, 96.8 kg of fruits (3.1 kg of seeds) from 33 trees in the forest district Kaczory and 100.0 kg of fruits (2.5 kg of seeds) from 69 trees in the forest district Krucz were collected. It was assumed that participation of individual forest districts in *ex situ* programme will be voluntarily. The details including the reduced area of planting, number of saplings and financial outlays are given in Table 1. *Sorbus torminalis* saplings will be planted on sites with appropriate habitat conditions for the species, proposed by forest districts. The progeny plantations

Table 1. Programme of *ex situ* measures in forest districts (written in italics – saplings originate from Kaczory, the remaining ones – from Krucz)Tabela 1. Program działań *ex situ* w nadleśnictwach (te, które zapisano pochyłą czcionką, otrzymały sadzonki z Nadleśnictwa Kaczory, pozostałe – z Nadleśnictwa Krucz)

Forest district Nadleśnictwo	Reduced area Po- wierzchnia zreduko- wana (ha)	Year of establishment of progeny plantations – Rok założenia upraw zachowawczych								
		2011			2012			2013		
		reduced area powierzchnia zreduko- wana (ha)	number of saplings liczba sadzzonek	financial outlays potrzeby finanso- we (PLN)	reduced area powierzchnia zreduko- wana (ha)	number of saplings liczba sadzzonek	financial outlays potrzeby finanso- we (PLN)	reduced area powierzchnia zreduko- wana (ha)	number of saplings liczba sadzzonek	financial outlays potrzeby finanso- we (PLN)
I Nature and Forest Region – I Kraina Przyrodniczo-Leśna										
Człopa	0.20	–	–	–	0.20	400	800	–	–	–
Kalisz Pomorski	0.15	–	–	–	0.15	300	1 700	–	–	–
Mirosławiec	1.00	1.00	2 000	1 800	–	–	–	–	–	–
Trzcianka	0.36	0.08	160	400	0.18	360	1 720	0.10	200	440
Tuczno	0.20	–	–	–	0.2	400	1 000	–	–	–
Subtotal Razem	1.91	1.08	2 160	2 200	0.73	1 460	5 220	0.1	200	440
III Nature and Forest Region – III Kraina Przyrodniczo-Leśna										
Durowo	5.00	–	–	–	2.00	4 000	11 810	3.00	6 000	16 000
<i>Jastrowie</i>	0.59	–	–	1 900	0.59	1 200	11 780	–	–	660
<i>Kaczory</i>	2.20	0.94	1 880	15 000	1.00	2 000	18 101	0.26	520	9 232.6
Krucz	1.25	0.14	280	2 124	0.7	1 400	9 958	0.41	820	6 748
<i>Lipka</i>	1.52	1.28	2 600	2 500	0.24	500	530.33	–	–	–
<i>Okonek</i>	0.61	0.06	150	100	0.25	500	304	0.30	600	400
<i>Plytnica</i>	0.06	–	–	–	0.06	150	200	–	–	–
<i>Podanin</i>	0.90	0.30	600	5 000	0.60	1 200	5 100	–	–	–
Potrzebowice	0.05	–	–	–	–	–	–	0.05	100	100
Sarbia	0.10	0.10	200	1 500	–	–	–	–	–	–
Trzcianka	0.23	0.15	300	500	0.08	160	400	–	–	–
<i>Walcz</i>	0.29	–	–	1 000	0.29	700	580	–	–	–
Wronki	0.14	–	–	–	0.14	550	630	–	–	–
<i>Zdrojowa Góra</i>	0.70	–	–	–	–	–	–	0.70	1 400	10 500
Złotów	1.01	0.35	700	3 500	0.36	700	6 000	0.30	580	7 000
Subtotal Razem	14.65	3.32	6 710	33 124	6.31	13 060	65 393	5.02	10 020	50 640.6
Total RDLP Razem RDLP	16.56	4.40	8 870	35 324	7.04	14 520	70 613	5.12	10 220	51 080.6

will be established in the form of groups or small clumps within regenerations both in complex and total cutting systems or within regeneration of free gaps. It was assumed that the saplings will be planted in amount of about 2000 pieces per hectare of reduced area. The plantations will be obligatorily protected against impact of deer. The plan accepted in 2010 assumed planting totally 33 610 saplings on reduced area of 16.56 ha within 19 forest districts. The total financial outlays were estimated to about 150 000 PLN. In 2011 it was decided to include also the population from Krzyż (I Nature and Forest Region) into *ex situ* Programme as a source of seeds for regeneration but only for forest district Krzyż.

Final remarks

The Programme presented here is the first complex programme of conservation and restitution of *S. torminalis* prepared on a scale of The Regional Directorate of the State Forests (RDLP) in Poland. The implementation of the Programme should firstly ensure stability of natural populations of *S. torminalis* existing within the area of RDLP in Piła. Further the species will be introduced into many new sites using local and polymorphic reproductive material. The Programme is an excellent example of commitment of State Forest in active protection of rare forest species protected by law in Poland.

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Streszczenie. W pracy przedstawiono założenia Regionalnego Programu Ochrony i Restytucji Jarzębu Brekinii (*Sorbus torminalis* (L.) Crantz) na obszarze działania Regionalnej Dyrekcji Lasów Państwowych w Pile w latach 2010-2013. Przeprowadzona w 2008 roku inwentaryzacja wykazała występowanie 3977 okazów badanego gatunku na terenie siedmiu nadleśnictw. Dwie najliczniejsze populacje zlokalizowane są na terenie nadleśnictw Kaczory i Krucz. Przyjęty program obejmuje działania z zakresu ochrony *in situ* i *ex situ*. Działania *in situ* polegają głównie na prześwietlaniu drzewostanów z udziałem brekinii w celu stworzenia optymalnych warunków świetlnych oraz na inicjowaniu i ochronie odnowień naturalnych. Działania *ex situ* zakładają wprowadzanie na nowe stanowiska – na terenie 19 nadleśnictw – sadzonek brekinii wyprodukowanych z nasion pochodzących z nadleśnictw Kaczory i Krucz. Do programu *ex situ* postanowiono włączyć później również nadleśnictwo Krzyż, na którego terenie ma być wprowadzana brekinia pochodząca z lokalnej populacji.

Słowa kluczowe: drzewa, *Sorbus torminalis*, ochrona, zasoby genowe, działania *in situ* i *ex situ*

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