Poljudno poročilo rezultatov projekta

LIFE ARTEMIS - Osveščanje, usposabljanje in ukrepanje za invazivne tujerodne vrste v gozdu

Layman's Report

LIFE ARTEMIS Project - Awareness Raising, Training and Measures on Invasive Alien Species in Forests

O PROJEKTU LIFE ARTEMIS

Ime projekta:
Osveščanje, usposabljanje in ukrepanje za invazivne tujerodne vrste v gozdu (LIFE ARTEMIS)
LIFE15 GIE/SI/000770

Trajanje:
7. 7. 2016 do 31. 10. 2020

Vrednost projekta:
1.091.503 €

Finančni prispevek Evropske komisije:
647.701 €

Koordinator upravičenec:
Gozdarski inštitut Slovenije
www.gozdis.si

Partnerji:
Zavod Republike Slovenije za varstvo narave
zrsvn-varstvonarave.si

Zavod za gozdove Slovenije
www.zgs.si

Zavod Symbiosis, so. p.
www.zavod-symbiosis.si

Sofinancerji:
Projekt LIFE ARTEMIS finančno podpira Evropska komisija v okviru finančnega mehanizma LIFE, podprograma LIFE+ Okoljsko upravljanje in informiranje. Projekt poleg partnerjev sofinancirajo Ministrstvo za okolje in prostor Republike Slovenije, Mestna občina Ljubljana in Javna agencija za raziskovalno dejavnost Republike Slovenije.

ABOUT THE LIFE ARTEMIS PROJECT

Name of the project:
Awareness Raising, Training and Measures on Invasive Alien Species in Forests (LIFE ARTEMIS)
LIFE15 GIE/SI/000770

Duration:
7. 7. 2016 to 31. 10. 2020

Project value:
1.091.503 €

Financial contribution of the European Commission:
647.701 €

Coordinating beneficiary:
Slovenian Forestry Institute
www.gozdis.si

Associated beneficiaries:
Institute of the Republic of Slovenia for Nature Conservation
zrsvn-varstvonarave.si

Slovenia Forest Service
www.zgs.si

Institute Symbiosis, so. e.
www.zavod-symbiosis.si

Co-financers:
The LIFE ARTEMIS project is financially supported by the European Commission in the framework of the LIFE financial mechanism, sub-program LIFE+ Environmental Governance and Information. In addition to the partners, the project is also co-financed by the Ministry of the Environment and Spatial Planning of the Republic of Slovenia, City Municipality of Ljubljana and Slovenian Research Agency.

Projektni partnerji / Project partners:

GOZDARSKI INŠTITUT SLOVENIJE
SLOVENIAN FORESTRY INSTITUTE

ZAVOD REPUBLIKE SLOVENIJE ZA VARSTVO NARAVE

ZAVOD SYMBIOSIS, socialno podjetje

ZAVOD za GOZDOVE SLOVENIJE

Sofinancerji projekta / Project co-financers:

REPUBLIKA SLOVENIJA
MINISTRSTVO ZA OKOLJE IN PROSTOR

Mestna občina Ljubljana

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Invazivke

TUJERODNE VRSTE V GOZDOVIH

Slovenija je ena izmed najbolj gozdnatih držav v Evropi. Gozdovi, ki pokrivajo skoraj 60 odstotkov površine, nudijo življenjski prostor številnim rastlinam, živalim in mikroorganizmom. Dobro ohranjeni gozdovi igrajo edinstveno vlogo pri blažitvi posledic podnebnih sprememb, saj drevesa v svoji biomasi shranjujejo velike količine ogljika. Gozdovi nudijo prostor za rekreacijo in sprostitev ter so pomemben vir lesa. V Sloveniji, kjer ima vsak četrti prebivalec v lasti vsaj majhen del gozda, so gozdovi tudi del nacionalne identitete.

KAJ SO TUJERODNE VRSTE?

Tujerodne vrste so rastline, živali, glive in mikroorganizmi, ki jih je **človek zanesel izven območja njihove naravne razširjenosti.** Nekatere od njih se na novem območju hitro širijo in **negativno vplivajo na domače vrste, habitate in ekosisteme**. Zaradi invazivne narave jih imenujemo **invazivne tujerodne vrste.**

V zadnjih letih so številne vremenske ujme in posledično napadi podlubnikov povzročili opazno škodo v večjem delu slovenskih gozdov. V vrzelih, ki so nastale za podrtimi drevesi, so se naselile tudi tujerodne vrste. Nekatere od njih se hitro širijo in negativno vplivajo na naravne procese v gozdu. Obvladovanje inazivnih tujerodnih vrst in preprečitev novih vnosov sta bistvenega pomena za ohranjanje zdravja naših gozdov.

ALIEN SPECIES IN FORESTS

Slovenia is one of the most forested countries in Europe. Forests cover almost 60 per cent of the land area and offer a variety of habitats for plants, animals and microorganisms. Well-preserved forests play a unique role in mitigating the effects of climate change because trees store large amounts of carbon in their biomass. Forests offer opportunities for recreation and relaxation and are also an important source of timber. In Slovenia, where each fourth inhabitant owns at least a small patch of forest, they are also part of the national identity.

WHAT ARE ALIEN SPECIES?

Alien species are plants, animals, fungi and microorganisms which are **introduced by humans to areas outside of their natural distribution.** Some of them rapidly spread and **negatively affect native species, habitats and ecosystems**. Because of their invasive nature, they are called **invasive alien species.**

In recent years, several destructive storms and subsequent bark beetle outbreaks have caused noticeable damage to large parts of Slovenian forests. The numerous gaps created by fallen trees were soon invaded by alien species, some of which are spreading quickly and disrupting natural processes. Management of invasive alien species and the prevention of new introductions are essential for maintaining the health of our forests.


Marija Stare

Navadna barvilnica, severnoameriška zelnata rastlina, je marsikje po Sloveniji povsem prekrila gozdna tla in močno ovira pomlajevanje gozda.

In many parts of Slovenia, the American pokeweed, a North American herb, has covered the forest floor and is severely impeding forest rejuvenation.

VPLIVI TUJERODNIH VRST NA GOZDOVE

Invazivne tujerodne vrste so za gozdove velika grožnja. Vnašajo motnje v kompleksne preplete povezav in rušijo ravnovesje v gozdnem ekosistemu, kjer ima vsaka domorodna vrsta svojo pomembno vlogo.

IMPACTS OF ALIEN SPECIES ON FORESTS

Invasive alien species are a major threat to forests. They disrupt the complex network of connections and cause an imbalance in the forest ecosystem, where each native species has its own important role.

Japonski dresnik je ena najbolj invazivnih tujerodnih rastlin v Evropi in tudi v Sloveniji je že zelo razširjen. Velike negativne vplive na biotsko raznovrstnost opažamo predvsem v nižinskih gozdovih in ob vodotokih, kjer oblikuje goste sestoje in izrinja domorodne vrste.

Japanese knotweed is one of the most invasive alien plants in Europe and is also widespread in Slovenia. Its negative impacts on biodiversity are particularly noticeable in lowland forests and along watercourses where it forms dense stands and outcompetes native species.

Hrastove čipkarke sesajo listni sok in s poškodbami povzročijo zgodnje rumenenje listov ter s tem močno vplivajo na fotosintezo.

The oak lace-bug sucks leaf sap which causes early leaf yellowing and thus negatively impacts photosynthesis.

Zaradi bolezni jesenov ožig, ki jo povzroča tujerodna gliva, se lahko okužena odrasla drevesa jesenov v nekaj letih popolnoma posušijo.

Ash dieback disease caused by an invasive alien fungus often results in the death of mature ash trees after several years.

PROJEKT LIFE ARTEMIS

Pri selitvi tujerodnih vrst je vedno namerno ali nenamerno vključen človek, zato je ozaveščanje o problematiki ključnega pomena za preprečevanje novih vnosov in širjenja invazivnih tujerodnih vrst. Kot odgovor na vse večje število tujerodnih vrst v gozdovih smo v štiriletnem projektu LIFE ARTEMIS poiskali **rešitve za učinkovito upravljanje s temi vrstami v gozdovih**. Osredotočili smo se na komunikacijske aktivnosti, namenjene strokovnjakom s področja gozdarstva in varstva narave, lastnikom gozdov, prostovoljcem in mladim.

THE LIFE ARTEMIS PROJECT

As humans are intentionally or unintentionally involved with the movement of alien species, raising awareness on this issue is crucial to prevent new introductions and the spread of invasive alien species. In response to increasing invasions in forests, the four-year LIFE ARTEMIS project aimed at **finding solutions for the effective management of invasive alien species in forests**. The project focused on communication activities directed towards professionals in forestry and nature conservation, private forest owners, citizen scientists and youth.

CILJI PROJEKTA LIFE ARTEMIS

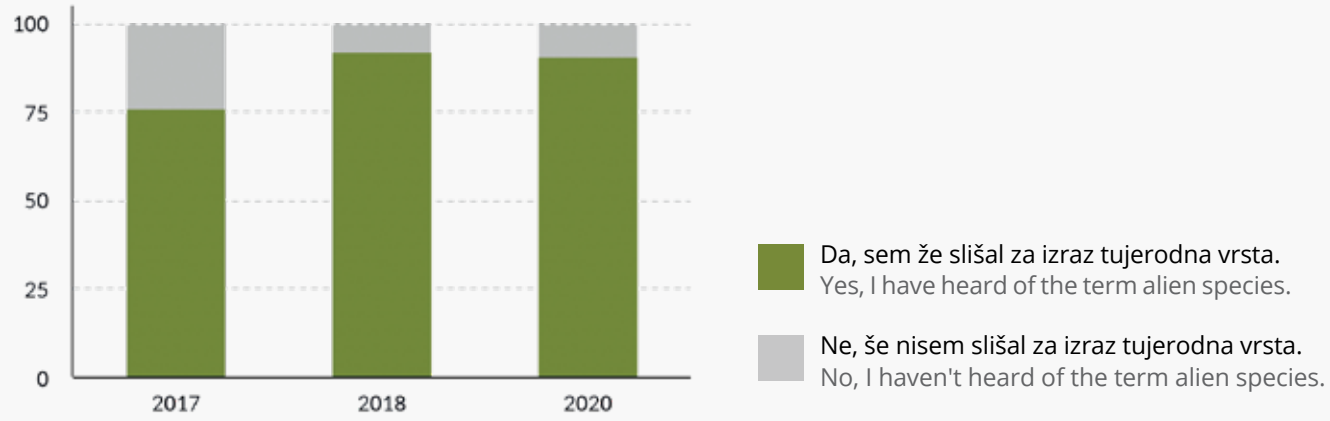
1. Povečati osveščenost javnosti, še posebej zasebnih lastnikov gozdov, glede nevarnosti, ki jo predstavljajo invazivne tujerodne vrste za gozdove.
2. Vzpostaviti učinkovit institucionalni okvir za zgodnje obveščanje in hitro odzivanje (ZOHO) za tujerodne vrste v gozdovih.
3. Izboljšati zmogljivost za zgodnje zaznavanje tujerodnih vrst v gozdovih z aktivacijo in usposabljanjem zaposlenih na področju upravljanja z gozdovi in prostovoljcev.

GOALS OF THE LIFE ARTEMIS PROJECT

1. To increase the awareness of the general public, and private forest owners in particular, of the threats posed by invasive alien species to forests.
2. To establish an efficient national institutional framework for early detection and rapid response for alien species in forests.
3. To improve the national capacity for the early detection of alien species in forests by mobilising and training professionals and volunteers.

ALI JAVNOST POZNA IZRAZ TUJERODNA VRSTA?

DOES THE PUBLIC KNOW THE TERM ALIEN SPECIES?



Z javnomnenjskimi anketami smo ugotovili, da se je delež anketirancev, ki so že slišali za izraz tujerodna vrsta, med letoma 2017 in 2018 precej povečal in tudi v letu 2020 ostal zelo visok.

According to surveys, the percentage of respondents who heard of the term alien species significantly increased from 2017 to 2018 and remained high in 2020.

PREPREČITEV VNOSA IN ŠIRJENJA

Ko gre za invazivne tujerodne vrste, je preventiva vedno boljša kot zdravljenje. V začetnih fazah invazije so tujerodne vrste redke in zato težko zaznavne. Po prilagoditvenem obdobju, ki lahko traja od nekaj let do več desetletij, pa se populacije povečajo in prostorsko razširijo. Z naraščanjem števila je vrste sicer lažje zaznati, večajo pa se njihovi negativni vplivi.

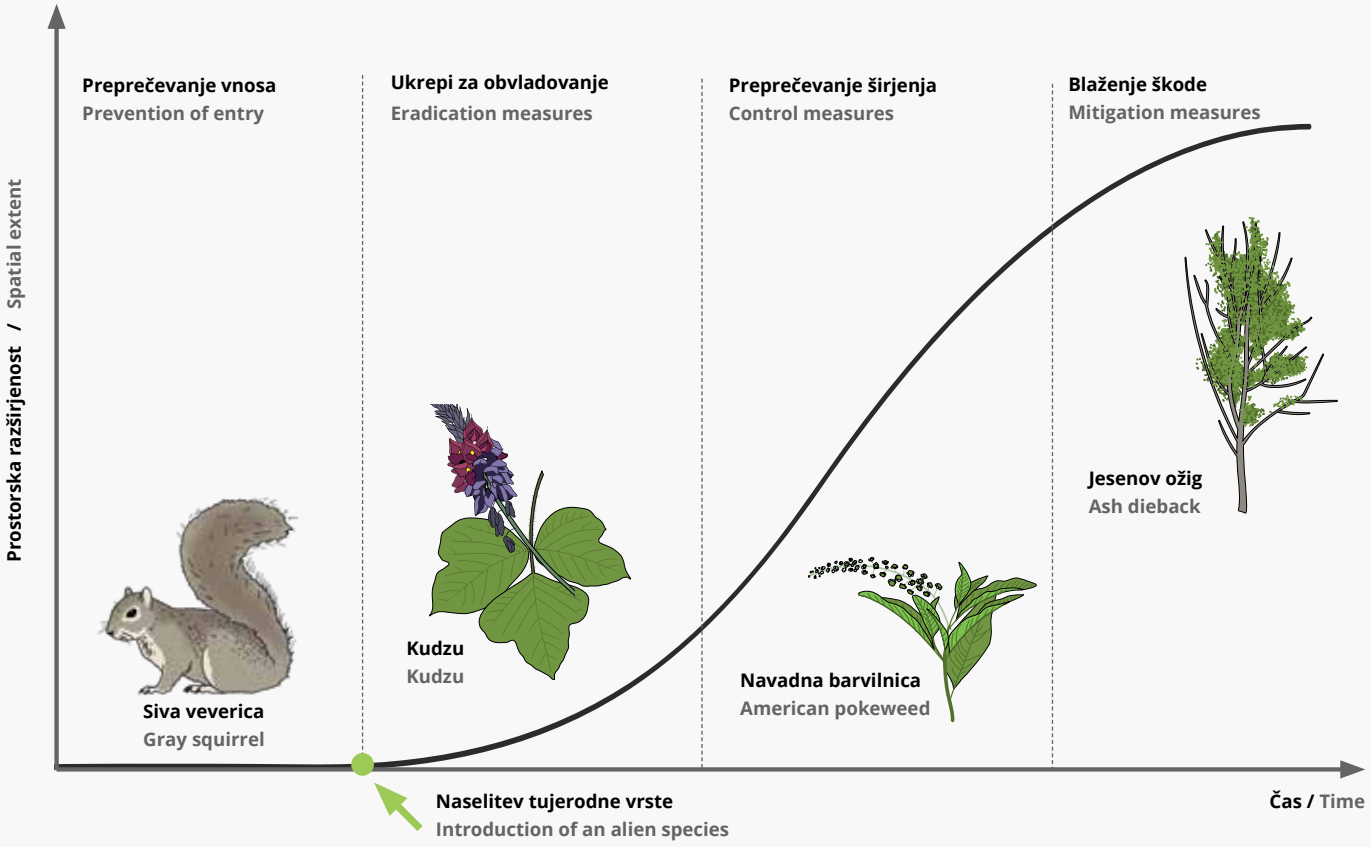
Močno razširjene invazivne vrste je skoraj nemogoče odstraniti iz okolja. Z nadzorom je njihove negativne vplive možno zmanjšati, a to zahteva ponavljajoče in drage ukrepe. Po drugi strani pa lahko vrste, ki so šele v zgodnjih fazah širjenja, z razumnimi stroški uspešno omejimo ali celo izkoreninimo. Zato je **zgodnje obveščanje in hitro odzivanje (ZOHO)** pri upravljanju z invazivnimi tujerodnimi vrstami vse bolj pomembno.

PREVENTING INTRODUCTION AND SPREAD

When it comes to invasive alien species, prevention is always better than the cure. In the initial stages of an invasion, alien species are scarce and therefore difficult to detect. After an adaptive period, which can take from a few years to several decades, their populations increase and spatially expand. With increasing populations, species are easier to find, and their negative impacts also increase.

Widely spread invasive species are nearly impossible to eradicate from the environment. Their populations may be controlled to reduce the negative impacts, but this requires continuous actions which are costly. On the other hand, in the early stages of an invasion, alien species can often be contained and eradicated at a reasonable cost. **The principles of early warning and rapid response (EWRR)** are becoming increasingly important in the management of alien species.

KAKO SE POVEČUJEJO POPULACIJE INVAZIVNIH TUJERODNIH VRST?
HOW DO POPULATIONS OF INVASIVE ALIEN SPECIES GROW?



Populacije invazivnih tujerodnih vrst se po ustalitvi v novem okolju povečujejo in prostorsko širijo. Če ne uspemo preprečiti vnosa ali jih izkoreniniti v zgodnjih fazah, so možni le še stalni ukrepi za preprečevanje širjenja ali ukrepi, s katerimi blažimo škodo. Z razširjenostjo tujerodnih vrst stroški obvladovanja hitro naraščajo.

After establishment, populations of invasive alien species increase and spatially expand. If we fail to prevent their introduction or are unable to eradicate them in the early phases of spread, we must resort to continuous management measures which slow their spread and mitigate the damage. As their populations expand, the costs of managing alien species rapidly increase.

ZGODNJE OBVEŠČANJE IN HITRO ODZIVANJE

V projektu LIFE ARTEMIS smo pripravili predlog institucionalnega okvira **sistema zgodnjega obveščanja in hitrega odzivanja (ZOHO) za invazivne tujerodne vrste v gozdu.** Osredotočili smo se na potencialne invazivne tujerodne vrste, ki so pri nas v zgodnjih fazah širjenja, in nove tujerodne vrste, ki že povzročajo težave drugod po Evropi. Vzpostavitev sistema ZOHO je tudi ena izmed ključnih določb evropske Uredbe o invazivnih tujerodnih vrstah 1143/2014.

Ključni deli sistema ZOHO za invazivne tujerodne vrste so: opozorilni seznam vrst, dobro usposobljeni opazovalci na terenu, orodja za sporočanje opažanj, ki omogočajo preverjanje točnosti podatkov, in učinkoviti načrti odzivanja. ZOHO zahteva premišljen institucionalni okvir z jasno razdeljenimi vlogami in odgovornostmi med organizacijami. Načrti odzivanja za posamezne tujerodne vrste se razlikujejo in vključujejo različne pristojne organizacije. V projektu LIFE ARTEMIS smo **poleg splošnega okvira sistema ZOHO pripravili predloge načrtov hitrega odzivanja za pet izbranih invazivnih tujerodnih vrst.**

EARLY WARNING AND RAPID RESPONSE

In the LIFE ARTEMIS project, we prepared a proposal for an **institutional framework for early warning and rapid response (EWRR)** for invasive alien species in forests. We focused on potentially invasive alien species which are in the early invasion stages and new alien species which are spreading across Europe. Setting up an EWRR system is also one of the core provisions of the EU Regulation on Invasive Alien Species 1143/2014.

The essential components of an early warning and rapid response system are an alert list of species, a pool of well-trained observers, reporting tools, including verification of data, and efficient response protocols. EWRR requires an efficient institutional framework with clearly defined roles and responsibilities among organisations. Response protocols vary between species, as different organisations may have to be involved. In the LIFE ARTEMIS project, **we prepared a proposal for a general EWRR framework and rapid response plans for five alien species.**

Vsi načrti na www.tujerodne-vrste.info
All plans at www.tujerodne-vrste.info

SHEMA SISTEMA ZOHO
EWRR SYSTEM DIAGRAM

1
Opažanje tujerodne vrste
Detection of an alien species

2
Določitev tujerodne vrste
Identification of an alien species

3
Vnos v aplikacijo Invazivke
Entry into the Invazivke app

4
Preveritev pravilnosti podatka
Verification of data

5
Ocena potencialne škode
Assessment of possible damage

6
Načrtovanje ukrepov obvladovanja
Planning response measures

PREPOZNAVANJE TUJERODNIH VRST

Nove invazivne tujerodne vrste se v Sloveniji stalno pojavljajo. Do neke mere lahko napovemo, katere so tiste, ki bodo verjetneje postale invazivne. To so vrste, ki so že invazivne v sosednjih državah oz. so v Sloveniji lokalno razširjene, vendar z opazno težnjo širjenja.

V projektu LIFE ARTEMIS smo opravili obsežno raziskavo in pripravili prvi **opozorilni seznam invazivnih tujerodnih vrst** v gozdu. Vrste s seznama smo predstavili v **Terenskem priročniku za prepoznavanje invazivnih tujerodnih vrst v gozdu**. Priročnik, prvotno izdan v slovenščini, je bil s finančno pomočjo projekta Alien CSI leta 2019 preveden tudi v angleščino.

RECOGNIZING ALIEN SPECIES

Many different alien species may appear in a country; however, to a certain extent, it is possible to predict which species are more likely to be introduced. These are alien species which are already invasive in neighbouring countries or even present in low numbers in Slovenia but show clear tendencies towards expanding their range.

In the LIFE ARTEMIS project, an extensive study was conducted to draw up the first **alert list of potentially invasive alien species in forests**. These alert list species are the focus of the **Field Guide to Invasive Alien Species in Forests.** The guide was initially published in Slovenian and translated to English in 2019 with the financial assistance of the Alien CSI project.

OPOZORILNI SEZNAM TUJERODNIH VRST
THE ALERT LIST OF ALIEN SPECIES

58
tujerodnih rastlin
alien plants

14
tujerodnih gliv
alien fungi

15
tujerodnih žuželk
alien insects

7
tujerodnih sesalcev
alien mammals

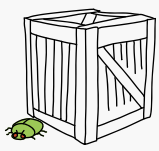
SLO

ENG

Prenesi si Terenski priročnik.
Download the Field Guide.

GLAVNE POTI VNOSA TUJERODNIH VRST
THE MAIN PATHWAYS OF INTRODUCTION OF ALIEN SPECIES

širjenje okrasnih rastlin z vrtov
spread of ornamental plants from gardens



transport blaga
transport of goods

spontano širjenje iz sosednjih držav
spontaneous spread from neighbouring countries

INFORMACIJSKI SISTEM "INVAZIVKE"

Bistven del sistema zgodnjega obveščanja je informacijski sistem, ki **omogoča sporočanje opažanj tujerodnih vrst** in hiter prenos informacij do strokovnjakov. V Sloveniji takega orodja v preteklosti nismo imeli, zato smo razvili nov informacijski sistem poimenovan "Invazivke".

Sistem sporočanja opažanj je moral biti enostaven za uporabo strokovnjakom in prostovoljcem. Najhitrejši način vnosa omogoča **mobilna aplikacija "Invazivke"**. Lokacija najdbe se avtomatično zapiše preko sistema GPS na mobilnem telefonu. Najdbe lahko vnesemo tudi preko računalnika, na spletni strani **www.invazivke.si**. Ta omogoča tudi pregled vseh najdb in podatkov, ki so javno dostopni.

Namen informacijskega sistema je bil zbrati tudi razpršene podatke o tujerodnih vrstah v Sloveniji iz različnih obstoječih baz podatkov in **vzpostaviti osrednjo podatkovno zbirko**. Do oktobra 2020 smo v sistem »Invazivke« zbrali podatke iz 9 drugih virov.

THE "INVAZIVKE" INFORMATION SYSTEM

An essential component of an early warning system is an information system which **enables reporting of sightings of alien species** and quick transfer of findings to experts. As such a system was not previously available in Slovenia, we developed a new information system called "Invazivke".

The reporting system had to be simple to be able to be used by experts and volunteers. The fastest way to submit the data is **via the mobile "Invazivke" app**. In this case, the location is automatically taken from the GPS on the mobile phone. Data can also be uploaded via computer through the website **www.invazivke.si**. In the desktop version, it is also possible to view records of all publicly available data.

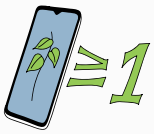
Our aim was to collate the scattered data on alien species from several national sources and **establish a central database**. By October 2020, Invazivke integrated data from 9 sources.

UPORABA INFORMACIJSKEGA SISTEMA "INVAZIVKE"*

THE USE OF THE "INVAZIVKE" INFORMATION SYSTEM*

18.266

vnosov neposredno v Invazivke
entries directly to the Invazivke app



428

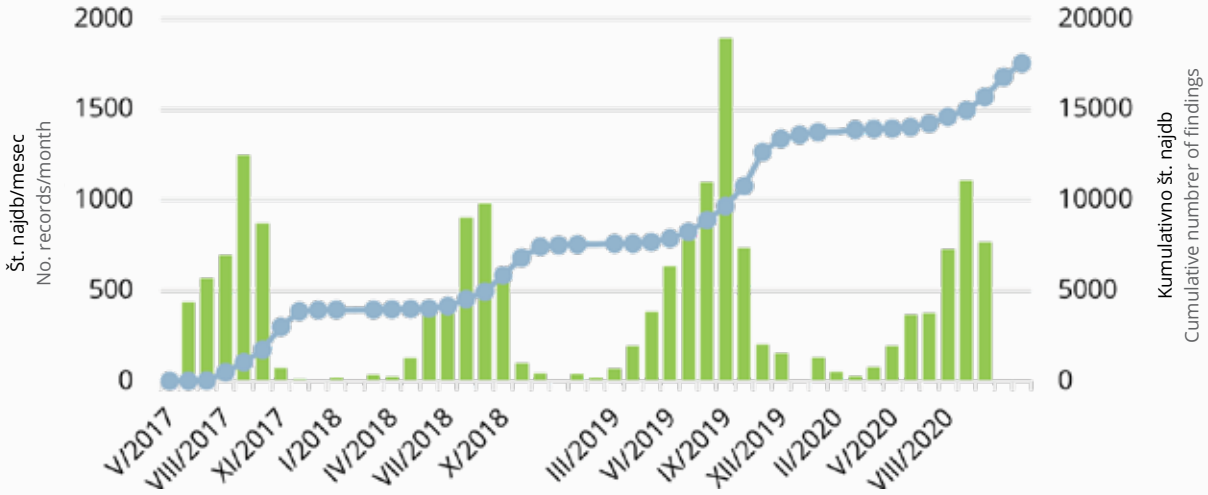
uporabnikov je sporočilo vsaj eno opažanje
users reported at least one observation

74.675

vseh opažanj v aplikaciji Invazivke
all observations in the Invazivke app

185

uporabnikov je sporočilo pet ali več opažanj
users reported five or more observations



V vseh letih smo največ podatkov zbrali pozno poleti in jeseni, ko cveti veliko invazivnih tujerodnih rastlin.

In all years, most data were collected in late summer and fall, when many invasive alien plants are flowering.

* stanje konec oktobra 2020 / status at the end of October 2020

PROMOCIJA APLIKACIJE "INVAZIVKE"

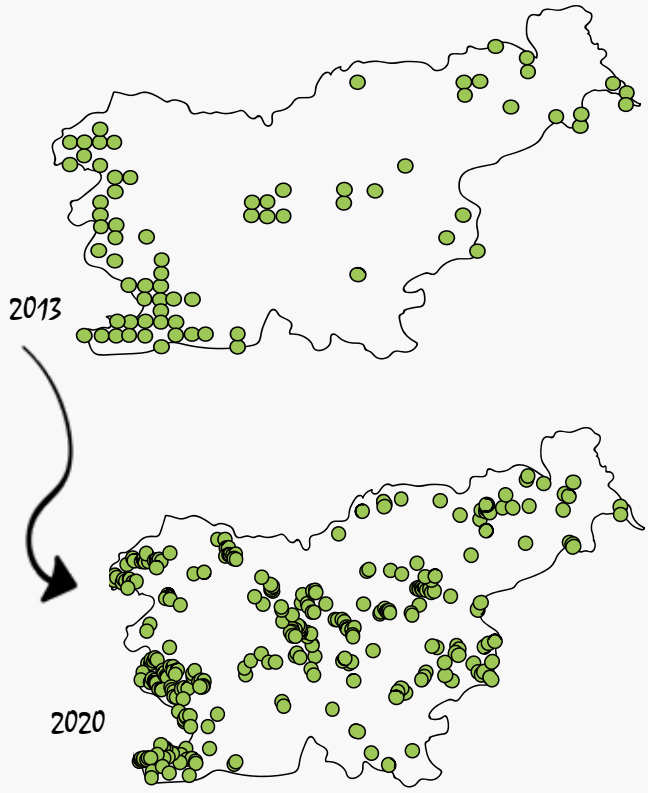
K opazovanju svoje okolice in sporočanju najdb tujerodnih vrst v aplikacijo Invazivke **smo spodbujali prostovoljce preko različnih aktivnosti**. Med drugim smo vsako leto izbrali eno tujerodno vrsto (žlezava nedotika, hrastova čipkarka, jesenov ožig, veliki pajesen), za katero smo s pomočjo letaka in objav v medijih prednostno zbirali podatke v aplikaciji. Za učence in dijake pa smo vsako leto septembra pripravili teden popisovanja tujerodnih vrst v okolici njihovih šol.

PROMOTION OF THE "INVAZIVKE" APP

Various activities were carried out through which volunteers were encouraged to observe their surroundings and report the findings of alien species into the "Invazivke" app. Each year we chose one alien species (Himalayan balsam, oak lace bug, ash dieback, tree of heaven) for which a special campaign with leaflets and media releases was implemented to collect data. Each year in September, we organised an invasive species survey week for students in primary and secondary schools to promote observation of alien species in their surroundings.

IZBOLJŠANJE POZNAVANJA RAZŠIRJENOSTI VELIKEGA PAJESENA

IMPROVING KNOWLEDGE ON THE DISTRIBUTION OF TREE OF HEAVEN



Znana razširjenost velikega pajesena leta 2013 (prirejeno po Jogan et al., 2013) in oktobra leta 2020 po podatkih zbranih v sistemu Invazivke. V tem času se je veliki pajesen razširil, zagotovo pa je bilo zaradi projektnih aktivnosti tudi zbranih več opažanj.

The known distribution of tree of heaven in 2013 (adapted after Jogan et al., 2013) and in October 2020 as collected in the Invazivke database. In these years the tree of heaven continued to spread, but also more observations were reported due to project activities.

Obišči www.invazivke.si ali si naloži aplikacijo "Invazivke" na Google Play!

Visit www.invazivke.si. The "Invazivke" app is only available to users in Slovenia.

USPOSABLJANJE O TUJERODNIH VRSTAH

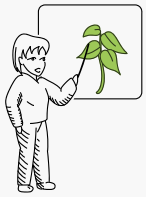
Invazivne tujerodne vrste je v začetnih fazah širjenja težko zaznati. Možnosti za najdbo povečamo z večjim številom usposobljenih opazovalcev, ki lahko invazivne tujerodne vrste odkrijejo med aktivnostmi v naravi. V projektu LIFE ARTEMIS smo o zaznavi invazivnih tujerodnih vrst **usposobili preko 1000 delavcev v gozdarstvu, varstvu narave, v različnih podjetjih povezanih z gozdarstvom ter lastnikov gozdov**. Organizirali smo številne aktivnosti, s katerimi smo vzpodbujali prostovoljce k sporočanju opažanj invazivnih tujerodnih vrst.

TRAINING ON ALIEN SPECIES

In the initial stages, IAS are difficult to detect. We can increase the chances of intercepting species when we increase the number of trained observers who passively observe them in nature. In the LIFE ARTEMIS project, **more than 1000 professionals in nature conservation, forestry and forestry-related businesses and forest owners participated in training on the detection of alien species**. Numerous activities were carried out to encourage citizen scientists to report sightings of alien species.


Frenk Prelec

ŠTEVILO UDELEŽENCEV USPOSABLJANJ
NUMBER OF PARTICIPANTS OF TRAININGS



43

usposobljenih regionalnih predavateljev
trained regional lecturers

521

delavcev v gozdarstvu in varstvu narave
forestry and nature conservation professionals

311

predstavnikov zainteresirane javnosti
representatives of the interested public

139

predstavnikov različnih podjetij
representatives of various businesses

Simon Zidar

OZAVEŠČEVALNA KAMPANJA

Ozaveščanje o negativnih vplivih invazivnih tujerodnih vrst je bil eden od glavnih ciljev projekta LIFE ARTEMIS. Poudarek naših aktivnosti je bil na **izboljšanju znanja širše javnosti o invazivnih tujerodnih vrstah** in spodbujanju odgovornega ravnanja ter prepoznavanju in sporočanju najdb tujerodnih vrst v gozdovih.

V zadnjem desetletju postajajo težave, ki jih povzročajo tujerodne vrste, vse bolj prepoznane. Že pred začetkom projekta je bilo zavedanje Slovencev o tej problematiki med najvišjimi v Evropi. Kot so pokazale javnomnenjske raziskave, pa so aktivnosti projekta prispevale k nadaljnjemu povečanju zavedanja. Državljani razumejo tveganje, ki ga predstavljajo tujerodne vrste, jih opažajo pogosteje in močno podpirajo vzpostavitev sistema zgodnjega obveščanja in hitrega odzivanja. Še bolj vzpodbudno pa je, da so pripravljeni sami ukrepati in preprečevati vnos in širjenje tujerodnih vrst z odstranitvijo vrst s svojih vrtov ter aktivneje sodelovati pri sporočanju novih najdb.

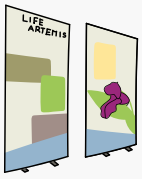
AWARENESS RAISING CAMPAIGN

Raising awareness of the negative impacts of invasive alien species was one of the main objectives of the LIFE ARTEMIS project. The focus of our activities was **improving public knowledge on invasive alien species** and encouraging citizens to behave responsibly and take action by recognising and reporting sightings of alien species in forests as citizen scientists.

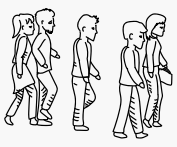
In the last decade, the problems caused by alien species have become increasingly recognised by the general public. Even before the start of the project, awareness among Slovenians of these problems was already among the highest in Europe. As shown by surveys, project activities contributed to a further increase in awareness. Citizens understand the risks posed by invasive alien species, notice them more often and strongly support the establishment of an early warning and rapid response system. What is even more encouraging is that citizens are willing to take personal action to prevent the introduction and spread of invasive alien species by removing them from gardens and becoming more active in reporting sightings.

OZAVEŠČEVALNI IN PROMOCIJSKI DOGODKI PROJEKTA LIFE ARTEMIS
AWARENESS RAISING AND PROMOTION EVENTS OF THE LIFE ARTEMIS PROJECT

49
predavanj za splošno javnost
lectures for the general public

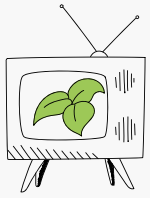


29
lokacij gostovanja razstave
locations hosting the exhibition



154.000
obiskovalcev razstave
exhibition visitors

947
udeležencev vodenih sprehodov
participants in guided walks



75
objav na televiziji in radiu
appearances on TV and radio

186
prispevkov v revijah in časopisih
newspaper and magazine articles

236
objav v spletnih medijih
appearances in online media

81.139
obiskovalcev projektne spletne strani
visitors to the project website

Simon Zidar

Simon Zidar


Gregor Skoberne

V sklopu nacionalne kampanje so se po vsej Sloveniji zvrstili številni ozaveščevalni dogodki. Tujerodne vrste smo predstavili na potujoči razstavi, sejmih, mnogih predavanjih, vodenih sprehodih ter tudi s poljudno brošuro.

During the national campaign, numerous awareness raising events took place. Alien species were presented through a traveling exhibition, trade fairs, many lectures, guided walks and a popular brochure.

OZAVEŠČANJE O JAVOROVEM RAKU

Ena od invazivnih tujerodnih vrst, ki se širi v slovenskih gozdovih, je gliva *Eutypella parasitica*, ki povzroča javorovega raka. Izvira iz Severne Amerike, **prva znana najdba te glive v Evropi pa je bila leta 2005 prav v Sloveniji**. Z namenom upočasnitve njenega širjenja je bila v projektu LIFE ARTEMIS pripravljena obširna ozaveščevalna kampanja in izvedeni številni ukrepi za omejitev njenega širjenja.

POSLEDICE OKUŽBE S TUJERODNO GLIVO

Na deblu drevesa se zaradi okužbe z glivo navadno razvije tipična eliptična rakava rana. Mlada drevesa se posušijo, starejša drevesa pa lahko postanejo manj mehansko stabilna. Bolezen povzroča ekološko in zaradi izgube vrednosti lesa tudi ekonomsko škodo.

Eutypella parasitica je ena redkih tujerodnih gliv, pri kateri so **zatiralni ukrepi še vedno možni** zaradi njenega počasnega širjenja. Projektne aktivnosti predstavljajo primer dobre prakse upravljanja z invazivnimi tujerodnimi vrstami. Z ozaveščanjem lastnikov gozdov smo vzpodbudili zbiranje opažanj te bolezni in nato ustrezno ukrepali.

Okužena drevesa so bila posekana, deli debla z okužbo pa postavljeni v gozd z rano obrnjeno proti tlom. Na tak način učinkovito preprečimo širjenje spor glive po zraku in nadaljnje širjenje te tujerodne glive.

AWARENESS OF CANKER OF MAPLE

One of the invasive alien species spreading in Slovenian forests is the fungus *Eutypella parasitica*, which causes Eutypella canker of maple. Originating from North America, **the first known finding of this fungus in Europe was in Slovenia in 2005**. In the LIFE ARTEMIS project, an extensive awareness campaign was launched, and control actions were taken to slow its spread.

EFFECTS OF THE INFECTION WITH ALIEN FUNGI

Due to the effect of the fungus on tree growth, typical elliptical cankers are usually formed on the bark of infected trees. When young trees are infected, they usually die, and older trees become mechanically unstable. The disease not only causes ecological but also significant economic damage, due to timber devaluation.

Eutypella parasitica is one of the few alien species where **control measures are still possible** due to its slow spread. Project activities represent an example of good practice in the management of invasive alien species. By raising awareness, forest owners were encouraged to report and take appropriate action.

The infected trees were felled and the infected parts of the trunk were placed on the ground with the wound facing towards the forest floor. This effectively prevents the spread of the fungal spores through the air and further spread of the invasive disease.

KAMPANJA O JAVOROVEM RAKU*
CANKER OF MAPLE CAMPAIGN*

13

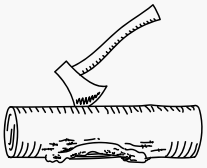
delavnic po vsej Sloveniji
training workshops across Slovenia

469

odkazanih okuženih dreves javora
issued decisions to cut infected maples

273

udeležencev usposabljanj
participants in training events



239

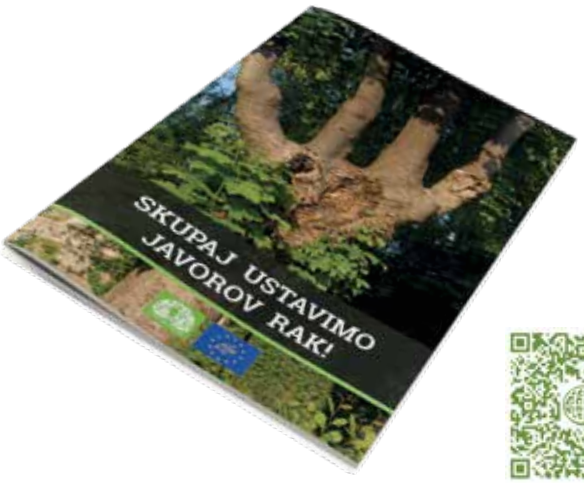
že posekanih okuženih javorov
maple trees that had already been cut

*stanje oktobra 2020 / status in October 2020

Simon Zidar

Tine Hauptman

Simon Zidar



Po odkritju javorovega raka, ki ga prepoznamo po ovalni rani na deblu, je drevo najbolje posekati, saj s tem preprečimo širjenje trosov v okolici. V času projekta je bila posekana več kot polovica najdenih okuženih dreves. Količino spor glive smo spremljali s posebnim lovilcem spor.

After finding trees infected with Eutypella canker, the best course of action is to cut the tree, which prevents the spread of spores. During the project, more than half of the known infected maple trees were cut. The number of spores was monitored with specialised spore traps.

TUJERODNE VRSTE NA ZAVAROVANIH OBMOČJIH

Tujerodne vrste se običajno najprej vzpostavijo na urbanih območjih, vendar se od tam sčasoma lahko razširijo tudi na naravna območja, kjer povzročajo opazno škodo biotski raznovrstnosti. Na zavarovanih območjih, kjer je glavni cilj prav ohranjanje biotske raznovrstnosti, je upravljanje s tujerodnimi vrstami bistvenega pomena.

V projektu LIFE ARTEMIS smo predstavili **sistematičen pristop k upravljanju tujerodnih rastlin na zavarovanem območju** z vključevanjem prostovoljcev. Krajinski park Tivoli, Rožnik in Šišenski hrib je edinstveno zavarovano območje, ki leži v osrčju Ljubljane. Vendar so tujerodne vrste prav zaradi bližine urbanih površin ena največjih groženj za to zavarovano območje.

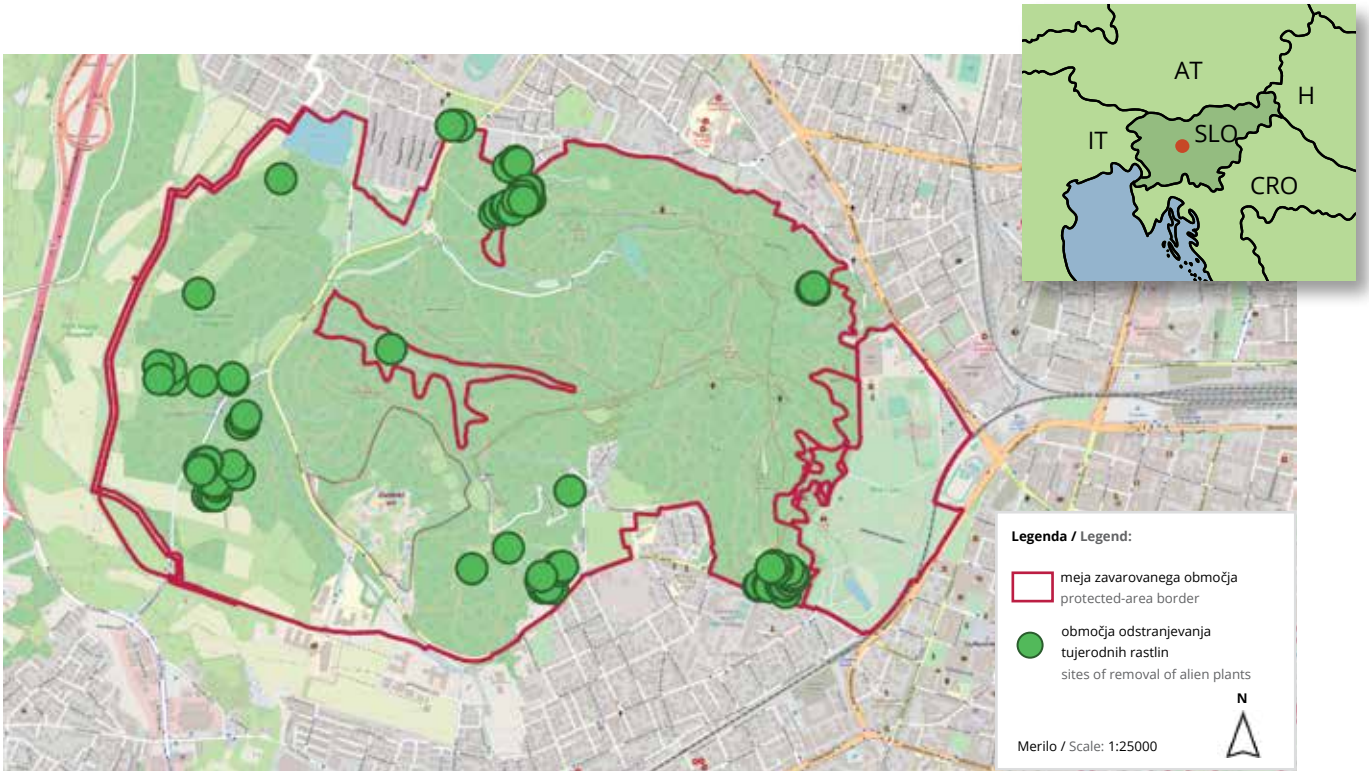
V prvi fazi smo izvedli sistematičen popis tujerodnih rastlin v krajinskem parku s pomočjo prostovoljcev. V sklopu akcij odstranjevanja smo nato **odstranili izbrane tujerodne vrste**, še posebej tiste, ki so v zgodnjih fazah širjenja ali se širijo na območja naravnih rezervatov. Pripravili smo tudi petletni akcijski načrt za obvladovanje invazivnih tujerodnih rastlin na tem zavarovanem območju, ki bo v pomoč upravljalcu, Javnemu podjetju VOKA SNAGA, pri sistematičnem naslavljanju problematike invazivnih tujerodnih rastlin.

ALIEN SPECIES IN PROTECTED AREAS

While alien species usually first invade urban areas, in time they can spread to more natural areas where they cause significant damage to biodiversity. In protected areas where the main objectives revolve around preserving biodiversity, management of alien species is essential.

In the LIFE ARTEMIS project, we showcased a **systematic approach to the management of alien plants in a protected area** with the involvement of volunteers. The Tivoli, Rožnik and Šiška Hill Landscape Park is a unique protected area because it lies in the heart of the city of Ljubljana, the capital of Slovenia. However, due to its proximity to urban areas, alien species are one of the greatest threats to this protected area.

In the first stage, we conducted a systematic survey of alien plants in the landscape park with the help of volunteers. During **eradication actions**, we especially targeted those invasive plants which were still in the early stages of invasion or were spreading in the nature reserves. We also developed a 5-year action plan for the management of alien plants in this protected area, which will assist the management authority, Public Holding VOKA SNAGA, in systematically addressing the issue of plant invasions.



Krajinski park Tivoli, Rožnik in Šišenski hrib z vseh strani obdajajo urbane površine in ceste, zato je pritisk tujerodnih vrst na območje zelo velik. S pomočjo prostovoljcev smo v sedmih akcijah odstranili tujerodne rastline na površini 20 ha (označeno z zelenimi točkami) (Podlaga: Open Street Map, Agencija RS za okolje).

The Tivoli, Rožnik and Šiška Hill Landscape park is surrounded by urban areas and roads and faces significant pressures from alien species. Alien plants were removed from a surface of 20 ha (green dots) in seven actions with the help of volunteers (Baselayer: Open Street Map, Slovenian Environmental Agency).


Simon Zidar


Simon Zidar


Jana Kus Veenvliet


Maarten de Groot

Simon Zidar

Namen akcij obvladovanja tujerodnih rastlin v Krajinskem parku Tivoli, Rožnik in Šišenski hrib ni bil zgolj njihova odstranitev in zmanjšanje negativnih vplivov, temveč tudi ozaveščanje. Pri delu so nam pomagali številni zainteresirani posamezniki in dijaki srednjih šol.

The main goal of activities in the Tivoli, Rožnik and Šiška Hill Landscape Park was not only to remove selected alien plants and reduce their negative impacts but also to raise awareness. Many interested individuals and high school students joined our activities.

IZMENJAVA IZKUŠENJ Z ODSTRANJEVANJEM TUJERODNIH VRST

S povečevanjem zavedanja o negativnih vplivih tujerodnih vrst se v Sloveniji povečuje tudi število akcij odstranjevanja tujerodnih vrst. Informacije o lokacijah, uporabljenih metodah in njihovi uspešnosti niso bile sistematično zbrane. Da bi izboljšali izmenjavo izkušenj med izvajalci aktivnosti odstranjevanja tujerodnih vrst, smo v sklopu projekta LIFE ARTEMIS vzpostavili platformo **Tujerodni vedež**.

Platforma deluje na principu odprtega posredovanja sporočil na spletno stran **www.tujerodne-vrste.info**. Informatorji se morajo na spletni strani registrirati, nato pa prek standardiziranega obrazca posredujejo informacije o vrsti, metodi odstranjevanja in njeni učinkovitosti, načinu odlaganja materiala ter oceni stroškov in viru financiranja. Zbrane informacije so urejene po vrstah in prosto dostopne vsem obiskovalcem spletne strani.

EXCHANGE OF EXPERIENCE ON ERADICATION METHODS

Increasing awareness of the negative impacts of alien species has led to an increase in the number of eradication actions in Slovenia. Information on locations, methods and their effectiveness used to be very dispersed. To improve the exchange of information among the eradication teams, a new platform called **Alien Oracle** was set up in the framework of the LIFE ARTEMIS project.

The platform is built on the principle of user-submitted posts which are sent to the homepage **www.tujerodne-vrste.info**. Informers have to register on the homepage and then post the information on a standardised form. This includes information on the alien species, the eradication method and its effectiveness, the method of disposal of material, cost estimation and source of funding. The collected information is organised by species and openly accessible to all website visitors.


Paul Veenvliet


Ana Tratnik

V času projekta LIFE ARTEMIS smo zabeležili več pomembnih najdb tujerodnih vrst. Tudi na podlagi našega dela na sistemu ZOHO so hitro stekle akcije za odstranitev dveh invazivnih tujerodnih rastlin, kudzuja (levo) in orjaškega dežena (desno).

During the LIFE ARTEMIS project, there were several important discoveries of alien species. Also due to our work on the EWRR system, eradication actions for two invasive alien plants, kudzu (photo left) and giant hogweed (photo right), started without delay.

MEDNARODNO SODELOVANJE

Invazivne tujerodne vrste ne poznajo državnih meja, zato je čezmejno sodelovanje pri njihovem upravljanju zelo pomembno. Projekt LIFE ARTEMIS je vzpodbujal **regionalno in mednarodno sodelovanje** na področju invazivnih tujerodnih vrst v gozdovih.

S študijskimi obiski in podpisanimi sporazumi o dolgoročnem sodelovanju in izmenjavi podatkov o tujerodnih vrstah s sosednjimi državami smo okrepili naša skupna prizadevanja. Sodelovali smo z več kot 10 drugimi LIFE projekti in naš projekt predstavili na 13 konferencah in srečanjih. K povezovanju in izmenjavi izkušenj je močno prispevala tudi mednarodna konferenca projekta LIFE ARTEMIS "**Zaznavanje in nadzor invazivnih tujerodnih vrst v gozdu v spreminjajočem se svetu**", ki je bila organizirana septembra 2019 v Ljubljani.

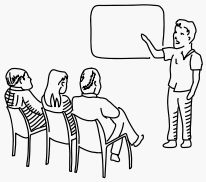
INTERNATIONAL COOPERATION

Invasive alien species do not recognise national borders; therefore, cross-border cooperation is very important for their management. The LIFE ARTEMIS project promoted **regional and international collaboration** in the field of invasive alien species in forests.

We have strengthened our joint efforts through study visits and signed memoranda of agreement with four neighbouring countries on long-term cooperation and exchange of data. Furthermore, we collaborated with more than ten other LIFE projects and presented our work at 13 different conferences and meetings. The international LIFE ARTEMIS conference "**Detection and control of forest invasive alien species in a dynamic world**", organised in September 2019 in Ljubljana, further encouraged networking and the exchange of experience.

Simon Zidar

ZNANSTVENI PRISPEVEK PROJEKTA
CONTRIBUTION OF THE PROJECT TO SCIENCE



13

obiskanih znanstvenih srečanj
visited scientific conferences

92

objavljenih strokovnih in znanstvenih prispevkov
published scientific and expert papers

KOLOFON

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LIFE ARTEMIS

Opazuj, sporoči in pomagaj varovati gozd.

Observe, report and help protect forests.