



## 2023 TOP 100 GOOD PRACTICE STORY

**Title:** With Proteus we share dependence on drinking water

**Destination, Country:** Kranj, Slovenia

**Submitted by:** Kristina Bogataj, Tourism Product Development; Gregor Aljančič, Head of Tular Cave Laboratory

**In the category:**  Destination Management  Environment & Climate  Thriving Communities  
 Nature & Scenery  Culture & Tradition  Business & Marketing

**The Story in a picture:**

Proteus, symbol of endangered biodiversity and loss of water resources



**Summary:**

Proteus is the most famous cave animal worldwide, an attraction exhibited to millions of visitors in a few show caves. However, the green story of Proteus and its emerging green tourism interpretation is its living story: the flagship of the endangered cave biodiversity, and aspiration for preservation of groundwater, the most important source of drinking water.

City of Kranj and Tular Cave Laboratory have built the SOS Proteus Information Centre through a public-private equity partnership to implement innovative solutions after 200 years of public display of Proteus:

- i) first-hand information from researchers,
- ii) neutral impact on nature by salvaging Proteus,
- iii) monitoring visitors impact on animal welfare,
- iv) sustainable management (investing in research, conservation & public outreach).

The Centre was one of the flagship projects that contributed to two high awards for Kranj: Destination of Excellence 2023 and Slovenia Green Destination Platinum, and mentioned in respected international media (Guardian, Times).



## Good Practice Story:

### Destination description

*Brief background of the destination.*

Kranj is the third largest city in Slovenia and the capital of the Gorenjska region. It lies at the foot of the Slovenian Alps and the old town centre stands on a conglomerate rock between the Sava and Kokra rivers. Here, visitors can experience the culture of the bustling city with its events and nature in one place, in the 30-metres-deep canyon of the Kokra River, where a walk along the river promises a green break in the middle of the city. One can explore the city's mysterious underground (the Tunnels Under the Old Town of Kranj and the SOS Proteus Information Centre) or climb 60 metres above the city squares and admire the view of the surrounding mountains (bell tower of the Church of St. Cantianus). Kranj is the only town in Slovenia from which you can see the highest peaks of the three Slovenian Alpine ranges, Triglav, Stol and Grintavec.

In its efforts to preserve Kranj's most important natural and cultural heritage, it was the green story of the endangered Proteus and its global message about the vulnerability of drinking water sources, among others, that convinced the European Commission and the Slovenian Tourist Board to award this year's prizes to this city. This was also a result of the commitment of the City of Kranj to actively promote the sustainable development of this destination in partnership with stakeholders in the field of environmental protection.

### Issues faced

*Problems/issues solved with the Good Practice Story.*

#### **IMPORTANCE OF THE PROTEUS AND ITS INTERPRETATION BY THE PUBLIC**

The olm or simply Proteus (*Proteus anguinus*) is a unique cave amphibian, endemic to the caves of the Dinaric Karst in South-East Europe – from North-East Italy, across Slovenia, parts of Croatia, Bosnia and Herzegovina, all the way to Montenegro. Despite its narrow geographic existence hidden in the inaccessible subterranean waters in a small patch of our planet, Proteus became “the Panda” of the endangered subterranean fauna, hence symbolically found its way into many languages worldwide, such as in Arabic (سَمَنْدَل الكُهوف الأوروپي), Chinese (洞螈), Croatian (čovječja ribica), Czech (macaráť jeskynní), Danish (Hulepadden), German & Dutch (der/de Grottenolm), French (le Protée), Greek (πρωτέας), Hebrew (פרוטיוס), Hindu (प्रोतयूस), Hungarian (barlangi vakgőte), Italian & Spanish (il/el proteo), Japanese (ホライモ), Korean (동굴도롱뇽), Latvian (eiropas protejs), Norwegian (Olmen), Persian (پروتئوس), Polish (odmieniec jaskiniowy), Portuguese (proteus), Romanian (proteul de peșteră), Russian (европейский протей), Slovakian (jaskyniar), Slovenian (človeška ribica [human fish]), Swedish (Europeisk olm), Turkish (mağara semenderi), Ukrainian (европейський протей) etc.

Slovenia is one of the most important hotspots of subterranean biodiversity on our planet, harbouring many endemic species. This exceptional natural heritage is symbolised by the Proteus, the first cave animal in the world to be scientifically described 260 years ago. Together with pioneering cave exploration, this led to the emergence of speleobiology and the recognition of Slovenia as the cradle of karstology, caving and cave tourism. The blind amphibian without skin pigment, with its unique adaptations to life in the inaccessible underground, puzzled the mind of early naturalists, from Linnaeus and Humboldt to Lamarck and Darwin, and has been an important natural history project in Slovenia for more than 300 years.

First and foremost, the Proteus is an endangered amphibian that has been protected in Slovenia since 1951. It has become a priority species under the EU Habitats Directive, listed on the IUCN Red List of Threatened Species and protected by the Natura 2000 network. The Proteus is threatened primarily by the increasing pollution of groundwater. Like humans, it lives up to 100 years, therefore even low but prolonged concentrations of toxins accumulating in its body and habitat can be fatal for the Proteus. Pollution comes mainly from intensive agriculture, industrial wastewater and unregulated urbanisation, and, significantly, from mass tourism. Public awareness is the basis for effective conservation measures for the conservation of the Proteus and its groundwater habitat.

### WHY PROTEUS IN KRANJ?

Although the city of Kranj lies outside the range of the Proteus (the nearest cave harbouring Proteus is about 30 km to the south-west), the Tular Cave Laboratory has been operating in the small Tular Cave in Kranj for more than 60 years. It is one of only two laboratories of its kind in the world, alongside the CNRS Cave Laboratory of Moulis in France. In order to encourage long-term research into the life of the Proteus, which remains hidden from us in the almost inaccessible caves, the cave biologist Marko Aljančič (1933–2007; <https://www.slovenska-biografija.si/oseba/sbi1000340/>), with the support of the Faculty of Medicine and the City of Kranj, converted the cave into a laboratory in 1960. Posthumously, he became an Honorary Citizen of Kranj (2008). Being one of the few private laboratories in the former Yugoslavia, it has been run by researchers of the Aljančič family since 1976, on a non-profit, voluntary basis and without any public financial support.

In order to keep these endangered cave amphibians for the future, we first need to get to know them as well as possible! In Kranj, they are studied both in the laboratory and in natural habitat, from Italy to Montenegro (<http://annualreport.cepf.net/2016/olivier.html>, <https://www.science.org/content/article/crime-solving-technique-maps-underground-lair-slovenian-dragon>). The protected amphibian is being studied using methods that do not disturb or harm it, such as observing its behaviour, which reveals its remarkable longevity, sensory abilities or slow reproduction. Individual specimens have lived in Kranj for more than 60 years and are therefore at least 80 years old, which suggests that the Proteus may live for up to 100 years. It was here in Tular that the first success in Slovenia was achieved with the reproduction of the Proteus outside nature. These methods of sustainable breeding and reproduction of the Proteus have been transferred from the Tular Cave Laboratory to the Postojna Cave in Slovenia and the Hermannshöhle in Germany.

Their findings are reported in international scientific journals (<http://www.tular.si/index.php/research>) and they promote the networking of the international scientific community in the field of Proteus research and conservation by organising the biennial SOS Proteus international meeting (<https://www.sosproteus2022.news/>). They invest special efforts in raising awareness and educating the public in Slovenia and worldwide, and have gained key references in developing more authentic promotion of Proteus in tourist caves (Postojna, Slovenia, 2002–2003, 2013; Vitina, Bosnia and Herzegovina, 2013–2014; Hermannshöhle, Germany, 2017; Jelševnik, Slovenia 2018–2020). In spite of working as volunteers and without public financial support, the Tular Cave Laboratory, and with it the City of Kranj, has become one of the international hubs for Proteus research and conservation (<https://www.biographic.com/saving-slovenias-human-fish/>; see scientific review: <https://doi.org/10.3986/fbg0050>).

## KEY CHALLENGES & UNIQUE SOLUTIONS

In the two centuries of modern cave tourism (Postojna Cave, Slovenia, 1819), Proteus has also become a global tourist attraction, and has been shown to over 40 millions of visitors of the Postojna Cave, the only place in Slovenia where the public can get a closer glimpse at the Proteus in a show aquarium. The story presented there has gradually lost its naturalistic authenticity and its mission in the public interest, particularly under the current private management. For two centuries, visitors from all over the world are still attracted merely by the sight of the Proteus gleaming amongst dripstone crystals; in a new, sustainable approach that we striving towards in Kranj, people shall be moved and changed by the realisation of the vulnerability of that same scene.

Namely, the message of the Proteus today – and thus of its emerging green tourism interpretation of the future, even though it became relevant yesterday – is its living story: the threat to the global symbol of subterranean biodiversity, and at the same time our action towards the preservation of groundwater, the most important source of drinking water on the planet. Although this most famous and charismatic cave animal lives only in a small part of our planet, it addresses in its own way one of the most important issues facing humanity. Around a quarter of the world's population and 75% of Europeans, rely on groundwater for their drinking water, much of it from the karst, which covers a third of Europe. Many major cities around the world, including Beijing, London, Moscow, Paris, Perth, San Francisco, and São Paulo, rely on groundwater, which in Slovenia accounts for 99% of the public drinking water supply. Last but not least, maintaining a healthy environment is also one of the key tasks of the Municipality of Kranj.

Since the 19th century, the tourist interpretation of the karst underground and Proteus has changed only very little. The presented project is unique in the world because it focuses on the Proteus as a symbol of global loss of biodiversity and natural resources. For the first time in 200 years of Proteus public show, the Information centre will serve as an the most needed example of sustainable transition of a multimillion tourist attraction, interlacing world's living natural heritage with the approaches of green tourism, mainly by ensuring:

- i) neutral impact on Proteus populations in the wild (specimens displayed are not obtained from their natural habitat),
- ii) welfare of the animals displayed (provision of adequate living conditions),
- iii) compliance with national and EU legislation (obtaining permission to remove specimens from the wild and permission to display to the public),
- iv) credibility of the promotion (scientifically correct information, nature-friendly operation, respectful marketing of the world's living natural heritage), and last but not least
- v) improvement of the conservation status of the species and its habitat (investment of all funds raised into the research and conservation programme of the laboratory).

Until now, the Tular Cave Laboratory has only been able to raise public awareness indirectly – through individual conservation projects, lectures, workshops and credible promotion in the media in Slovenia and around the world – not enough to really significantly reach the general public (e.g.,

<https://www.newyorker.com/tech/annals-of-technology/whats-behind-slovenias-love-affair-wit-h-a-salamander>, <https://www.biographic.com/saving-slovenias-human-fish/>) . With the SOS Proteus Information Centre, the Laboratory is finally opening its doors to the city and its visitors. The real potential of the research and conservation activities on which its credible public outreach is based, and the longer-term existence and development of the Laboratory,



could only be fully realised with a sustainable source of funding and permanent staff, one of the key objectives of the SOS Proteus Information Centre.

The biggest challenge was to provide a suitable space for public displays of Proteus, where living conditions similar to its cave habitat could be maintained (darkness, cave temperature with seasonal fluctuations, etc.). We also looked for a place where the Information centre would be as accessible as possible to visitors, especially those with special needs, implementing museum standards, but also safe for public use (fire safety, emergency exit, adequate lighting and signage). There is no suitable natural cave in Kranj, apart from the Tular cave, but there, the visits would interfere with research activities. Suitable facilities owned by the City of Kranj were found in the Tunnels Under the Old Town of Kranj, a large air raid shelter, which was opened for visitors by the Tourism and Culture Board Kranj in 2008 and, as the first of its kind in Slovenia, has become one of Kranj's most visited tourism attractions. Although the shelter is the work of human hands, the Tunnels have become part of nature over the decades. Because of the natural cracks of the conglomerate underground on which Kranj is built, cave animals have moved in, and the natural cave-like conditions are also suitable for the Proteus. The forgotten underground construction, which the town has actually revived on the initiative of the members of the Tular Cave Laboratory, is thus today serving a new nature conservation mission in its touristic transformation, in addition to serving as a reminder of the tragedy of the Second World War.

A particularly challenging task, which has not yet been completed, is the development of the souvenirs that will be made available to visitors. We want them to have educational value and to enrich the visitor with an intangible conservation message. The souvenirs should not be made of plastic, but of natural materials that are available in Kranj and the surrounding area, and the design and production in the details should be in line with scientific authenticity and a commitment to sustainable action.

### Methods, steps, and tools applied

*Solutions implemented to address the sustainability problems or issues.*

The project applicant, key planner and manager of the SOS Proteus Information Centre is the non-profit foundation Cave Laboratory Tular, which has been operating in Kranj since 1960. After decades of volunteer efforts in the field of Proteus research and conservation, and awareness raising without public financial support, the Laboratory needed the help of the city to develop its activities further, and especially to bring them closer to the public through an Information Centre. The idea is already 20 years old; the first initiative was launched by the Laboratory in 2008 and the creation of the current project started in 2018.

In the proposal for the establishment of the SOS Proteus Information Centre, which was unanimously adopted by the City Council on 23 June 2021, Kranj recognised multiple aspects in the public interest, which are pursued by the municipality in the fields of:

- i) nature conservation and protection of a healthy environment,
- ii) public awareness and education,
- iii) scientific research and
- iv) green tourism, and linked it more closely to the local community (e.g., revitalisation of the old part of Kranj, new green jobs in science and tourism, etc.).

A key step was the forming of a Public-Private Equity Partnership between the City of Kranj and the Tular Cave Laboratory (The Official Gazette of the Republic of Slovenia, <https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2021-01-1963/odlocitev-o-javno-zaseb-nem-partnerstvu-za-projekt-cloveska-ribica-v-kranju>). This type of institutionalised

public-private partnership is still extremely rare in Slovenia, especially since it is also non-profit-oriented on the part of the private partner, which is why the Institute for Public-Private Partnership, a leader in this field of law in Slovenia, was involved in the legal drafting of this partnership. The public-private partnership, in which the City of Kranj entered as a 32.5% co-founder of the Tular Cave Laboratory, ensures the long-term follow-up and development of public interest guidelines, the non-profit and sustainable operation of the SOS Proteus Info Centre, and that the funds raised will be used for research and conservation of the endangered Proteus.

The Tourism and Culture Board Kranj has joined the partnership as a key facilitator, contributing its expertise in marketing, organising visits and participating in the development of new green tourism products. On behalf of the Municipality of Kranj, it undertook a major part of the co-financing of the construction, to which the public partners contributed their share in total more than € 215,000, not including the significant voluntary contribution of the Laboratory.

Gregor and Magdalena Aljančič developed the project plan for the SOS Proteus Information Centre based on the 60-year experience of the Tular Cave Laboratory. These were years of communication and testing of individual solutions in the international scientific and nature conservation community, among stakeholders and the general public, and especially with regard to the practice of managing tourist caves that present the Proteus to the public.

The Tular Cave Laboratory conceived the SOS Proteus Information Centre as a platform for developing innovative conservation solutions in the field of the protected Proteus, which have not been used since 200 years of public display of this species:

1. First-hand information: for the first time, the display is not managed by a tourism organisation, but by an institution whose main activity is Proteus research and conservation;
2. Impact on nature: for the first time, the display has a neutral impact on natural populations because the animals are not taken from their natural habitat, but are rescued animals that have been brought to the surface by flooding of groundwater to where they would not otherwise have survived;
3. Animal welfare: for the first time, we are monitoring the impact of visitors on the animals that are on display;
4. Circular and sustainable management: for the first time, the admission fee directly co-funds research, Proteus conservation and public awareness-raising.

In designing its approach, the Laboratory was inspired by its valued stakeholders and partners, in particular the UNESCO sites Škocjan Caves Park, Slovenia (<https://www.park-skocjanske-jame.si/en/>); Speleovivarium Erwin Pichl, Italy (<https://sastrieste.it/index.php/speleovivarium/>); and Škocjanski zatok Nature Reserve, Slovenia (<https://www.skocjanski-zatok.org/en/>).

The Tular Lab has chosen circular sustainable management as its non-profit business model, where all funds raised are invested back into Proteus research and protection, public awareness-raising, and a smaller part is spent on natural science projects in the city. This will ensure the sustainable development and existence of the laboratory, and contribute to the generation of new tourism, educational, scientific research and other services of public interest in the City of Kranj. The revenue from the entrance fee is allocated according to the amount of funds raised: 100–80% for research, protection and public awareness of the Proteus, and up to 20% for the development of the Tunnels Under the Old Town of Kranj, the preservation of the protected nature park of the Kokra River canyon, and the presentation of other natural heritage sites in the municipality of Kranj

[http://www.lex-localis.info/files/55bbefb4-5791-4b80-a226-1d4ae59cc632/701353987232000000\\_7.%20Potrditev%20Pogodbe%20JZP%20Cloveska%20ribica.pdf](http://www.lex-localis.info/files/55bbefb4-5791-4b80-a226-1d4ae59cc632/701353987232000000_7.%20Potrditev%20Pogodbe%20JZP%20Cloveska%20ribica.pdf)

The story of the Proteus is told on a 120 m long circular route through the section of the Tunnels Under the Old Town of Kranj dedicated to the Information Centre: from the history of the research of the Proteus to the presentation of its life in the inaccessible underground, and from the pollution of the karst landscape to the vulnerability of the Proteus and the sources of our drinking water. By observing the Proteus in two large aquariums (each 3 m long, filled with 1.125 litres of water) at the end of this educational trail, visitors finally encounter the living story of the vulnerable Karst underground. Public display of Proteus as a highly protected species has received a positive expert evaluation by the Institute of the Republic of Slovenia for Nature Conservation and the permit of the Slovenian Environment Agency at the Ministry of Environment, Climate and Energy.

The construction of the Information Centre was coordinated by Gregor Aljančič, with support and under the supervision of Marko Čehovin (Municipality of Kranj), Tomaž Lanišek (Municipality of Kranj) and Klemen Malovrh (Tourism and Culture Board Kranj). The works were extremely challenging due to harsh environmental conditions in the underground tunnels, the inaccessibility to machinery and the unique engineering challenges involved. Town's tap water for supplying the Proteus aquaria, and drainage installation was donated by the Komunala Kranj (Kranj's Public Utility). A challenge was the placement of the interior fittings, designed by architect Aleš Peternel (APARH d.o.o.) and custom-made by Bojan Spasović and his colleagues (Remonting d.o.o.). The most challenging was the design of the two heavy aquariums with their myriad of detailed requirements for their casing (e.g., drainage of dripping water, sealing of individual parts and connection of others, etc.). A particular responsibility was required for the manufacture of the two delicate glass aquariums by the experienced Jože Benedičič. An on-going challenge is the moisture-sensitive electronic (e.g., video projectors) and communication equipment, as well as the surveillance and fire safety equipment, which, in addition to the valuable experience gained in the Tular Cave Laboratory, has been continuously addressed by the ingenuity of the project team and the contractors. Finally, the construction of the Information centre could not be achieved without the support of the dedicated team at the Tourism and Culture Board Kranj (Klemen Malovrh, Kristina Bogataj, Urša Erjavc, Tamara Maržič, Anja Rakovec and Manca Strugar), and all the volunteer effort of the Tular Cave Lab team (Gregor Aljančič, Magdalena Aljančič, Marija Aljančič, Tadeja Bele, Leopold Balažič, Marko Špelič, Katja Tavčar, Luka Vodnik and Primož Vodnik).

The Tunnels Under the Old Town of Kranj are protected as a technical heritage site. The construction of the Information Centre was therefore carried-out with minimal interventions into the walls of the Tunnels, under the strict conservation terms of the Institute of the Republic of Slovenia for the Protection of Cultural Heritage. The Institute has also supervised an archaeological investigation at the entrance of the Tunnels, performed by archaeologist Luka Rozman and colleagues (Augusta d.o.o.), however the site has already been destroyed by the construction works during the Second World War.

The content of the exhibition was created in voluntary work. Gregor and Magdalena Aljančič prepared the content on Proteus, Tadeja Šubic (Institute for Nature Conservation, Kranj) on the ecological vulnerability of Kranj, and Maja Rozman (Komunala Kranj/ Kranj's Public Utility) on drinking water supply and waste management. The written content part was reviewed by Teo Delič, Rok Kostanjšek and Valerija Zakšek (Biotechnical Faculty, Ljubljana). Additional photographs were contributed by Danté Fenolio (San Antonio Zoo, USA), Ciril Mlinar Cic (Water Cycle Institute), Matej Blatnik, Franjo Drole & Andrej Mihevc (Krust

Research Institute ZRC SAZU) & Tomaž Grdin (Caving club of Novo mesto). The musical was selected by Zvone Tomac. Special parts of the exhibition are short documentary films, three of them made by the renowned cave diver Ciril Mlinar Cic. Excellent graphic design was a creation of Aljaž Primožič (Carnus Institute), together with the integrated graphic image of the Information Centre.

The aquariums currently house three White Proteus, rescued after groundwater floods. Visitors are involved in monitoring the impact of visitors on the animals, following the principles of citizen science. The behaviour of the Proteus is monitored with an infrared video camera, while the installed sensors are measuring illumination, sound intensity, water and air temperature, electrical conductivity of the water, water level, etc.). The data collected will also be used for a pioneering study of the impact of visitors on the publicly displayed Proteus, and in the most practical sense, to improve the conditions for their display world-wide.

### Key success factors

*Critical elements that led to successfully solving the issues.*

Due to the symbolic importance of the Proteus in Slovenia, the project received great public support and media attention from the beginning. The high public expectation has given the project team a burden of great responsibility, but at the same time this positive energy has strengthened and connected us.

The project would not have succeeded without the personal commitment of the Mayor of Kranj Matjaž Rakovec and Deputy Mayor Janez Černe, the unanimous support of the City Council, Tomaž Lanišek (City of Kranj) Marko Čehovin (City of Kranj) as the administrative coordinator of the partnership and the municipal services, the active participation of Klemen Malovrh (Tourism and Culture Board Kranj), the volunteer contribution, knowledge and enthusiasm of people at the Tular Cave Laboratory, and the support of the local community. Of key importance was the successful cooperation with the construction contractors, who struggled to solve the difficult technical challenges in the harsh conditions (e.g., working in the dark, cold and humid tunnels).

The presentation of sensitive Proteus to the public is based on the 60 years of experience of the Tular Cave Laboratory and the involvement of Slovenian nature conservation services in the planning and construction of the info centre.

### Lessons learned

*Challenges faced while implementing the Good Practice and their solutions.*

We were negatively surprised to realise that the Proteus in Slovenia does not only symbolise the endangered biodiversity and loss of drinking water resources, but that the public perception of the Proteus as an unsustainable tourism product is increasingly being reinforced. The initiative on how green tourism can be a source of investments in nature conservation in a circular way, has not yet found favour in many local communities. More attractive remains the mass tourism example of Postojna Caves, where millions in profit have not yet found their way to sustainable management. This is also the case of a local NGO, which is advocating the suppression of the permit to display the endemic Black Proteus outside the Bela Krajina Region, SE Slovenia. Instead of trying to solve the environmental burdens there, they are striving for a monopoly of tourist destinations. The key challenge in long term remains in communication with stakeholders.



To get closer to individual target groups (e.g., school youth), we wish to adapt the story of Proteus closer to the school curriculum, which is why we have already established links with teachers from primary and secondary schools in Kranj, and have already been enriched on both sides by visits from foreign teachers of their study exchange programmes.

Kranj is part of the EU Mission for climate-neutral and smart cities by 2030, so it is crucial to encourage our visitors to reduce their environmental footprint. We advise them towards sustainable mobility (walking, e-bikes, e-cars, public transport), as well as how each individual can improve their daily behaviour to contribute to reducing their footprint both during their tourist visit and when they return home. We wish to include this kind of message in the souvenirs in the museum shop (e.g., natural materials used, educational message of nature conservation).

### Achievements and Results

*Direct and indirect results of the Good Practice.*

By establishing the SOS Proteus Information Centre, we have addressed all three pillars of sustainability (environmental, economic and social). First and foremost, the importance is on the environmental pillar, where we conserve Proteus and present ways of protecting the environment and how everyone can contribute, while at the same time taking care of the environment by ourselves every day so that Proteus can survive in the future. The second pillar is economic, where a public-private partnership was set up, based on the fact that the entrance fee collected goes back into raising the capability of the public services of the Laboratory and the Information centre, and the bulk of it goes into research and protection of the Proteus. The third part is social, which is addressed in the way that Kranj is also being established and developed as a centre of international scientific research and conservation. Through this, new jobs could be created and it could be ensured that Kranj researchers stay in Kranj.

Below is our presentation of the objectives we have set to monitor the success of the project and their implementation:

- 1. Public-Private Equity Partnership between the City of Kranj and the Tular Cave Laboratory**
  - On 23 June 2021, the City Council of Kranj unanimously accepted the proposal of the Tular Cave Laboratory to enter into a Public-Private Equity Partnership, together with a project plan for the establishment and management of the SOS Proteus Information Centre.
  - Signing of the Public-Private Equity Partnership between the City of Kranj and Tular Cave Laboratory: The partnership agreement was signed on 5 October 2021, the funds for the construction of the SOS Proteus Information Centre in the Tunnels Under the Old Town of Kranj were co-financed by the Tourism and Culture Board Kranj, and in line with this agreement, on 11 February 2022, the City of Kranj became a 32.5% co-founder of the Institute Tular Cave Laboratory, Kranj.
- 2. Construction and establishment of the SOS Proteus Information Centre**
  - The construction of the SOS Proteus Information Centre started on 1 October 2021 and was completed on 9 November 2022.
  - The Information Centre was put into operation on 10 November 2022, when it was handed over to the private partner Tular Cave Laboratory.
  - Display at least 2 or up to 5 White Proteus (*Proteus anguinus anguinus*) in the aquaria.

This objective has been achieved with a minimum number of animals in order to be able to present the living story of the Information Centre to visitors.

- To have at least 2 or at most 3 Black Proteus (*Proteus anguinus parkelj*) in the aquaria.

We have not yet met this target because we have not yet been able to find any Black Proteus that have been flushed out of their natural habitat, while at the present the permit issued by the Slovenian Environment Agency has been challenged by the Bela Krajina environmental NGO, striving to monopolize the public presentation of this proteus subspecies in Bela Krajina (see comment in section Lessons Learned).

- Four common species of cave invertebrates are presented in four small aquaria or terrariums: Cave Spider (*Meta menardi*), Cave Cricket (*Troglophilus neglectus*), Cave amphipode Crustacean (*Niphargus slovenicus*), Cave Shrimp (*Troglocaris anphthalmus*).

This target has not yet been met as we are still waiting for the Slovenian Environment Agency's permission.

- The monitoring of the impact of visitors on the animals on display is not yet automated due to lack of funds, and is at the moment measured manually. The system will be completed by the end of this year, financed with the entrance fees collected.

### 3. Operation of the SOS Proteus Information Centre

- We opened our doors to the public on 12 December 2022. Regular guided tours are scheduled 4 times a week, with out-of-hours tours available by appointment for pre-booked groups.
- Ticketing system is in place at the Tourist Information Centre (<https://www.visitkranj.com/en/tours-and-trips/sos-info-centre-proteus/>).
- The content of the Information Centre has been adapted to the two planned starting levels of difficulty: school children, general public. Guided tours are conducted in Slovenian, English and German, while the translation of the electronic content into Italian, French and Korean remains incomplete.
- We have trained three guides to give expert tours of the Information Centre, ranging from experienced Proteus researchers to enthusiastic biology students.
- Visitor numbers – between 600 and 7,300 visitors in the first year of operation.

The Information Centre has been open to the public for seven months and has received around 850 visitors, so we have already exceeded our minimum target for this year. The funds raised so far by the Tular Cave Laboratory are used entirely to finance the operation of the Information Centre and the Laboratory.

### 4. Promotion of the SOS Proteus Information Centre to the national and international public

- Publications in the media – to achieve at least 200 publications in Slovenian media in the first year.

Since the start of the project, more than 150 longer or shorter articles in a wide range of local and national media, as well as in prominent UK media (The Guardian, The Times) have reported on the new acquisition and the objectives of the Information Centre.

- Promotion of the Information Centre by the City of Kranj and the Tourism and Culture Board Kranj:

The City of Kranj and the Tourism and Culture Board presented the Information Centre as part of the promotion of Kranj as the European Destination of Excellence 2023 at ITB Berlin 2023. The two public partners are actively inviting local and foreign journalists to visit the Information Centre, and we are particularly pleased to have been able to convey the message of the Proteus to the delegations of our twin cities that have visited Kranj in the

meantime (Colorado Springs, USA; Hercegnovi, Montenegro; La Ciotat, France; Muratpaşa, Turkey; Székesfehérvár, Hungary; Zhangjiakou, China). The Information Centre was presented also at the recent international conference “Think Green, Go Sustainable” in Kranj (<https://www.kranj.si/en/international-conference-think-green-go-sustainable-followed-by-representatives-from-eleven-countries>).

- Raising public support for Proteus research and protection and for safeguarding drinking water resources.

This is a fundamental objective we have set ourselves because of its importance, despite its prevalently long-term effects and the difficulty to define indicators. Nevertheless, it can be assessed that the Information Centre has already become visible among decision makers (i.e., Ministry of the Environment, Climate and Energy, Slovenian Environment Agency, and the Institute for Nature Conservation) and the scientific public of key importance (i.e., Biotechnical Faculty at the University of Ljubljana, Council for protection of environment at the Slovenian Academy of Sciences and Arts, Slovenian Museum of Natural History, LifeWatch-Italy), who have already visited us or have announced their visit.

- Raising awareness among target groups and involving new stakeholders in the activities of the laboratory and the information centre.

Despite the short period of operation, the most noticeable response was expected from primary and secondary schools in the Gorenjska region, with school youth as the most important target group (17 groups already visited the Centre), an unplanned active initiative for cooperation by head teachers and teachers, and visits of students with foreign teachers from the international exchange programmes (Czech Republic, Portugal). We were particularly surprised by the great interest of students of the Biotechnical Centre Naklo in the field of nature conservation studies. Due to the lack of capacity at the Tular Cave Laboratory, we were unfortunately only able to accept two students for a one-month placement, but the extended cooperation announced for the coming school year promises to be of great all-round benefit to the students, the school and the Information Centre.

We also found unexpected stakeholders in the emerging field of science-arts. In 2023, the Textile Art Biennial BIEN is taking place in Kranj, and it has placed a part of its exhibition in the Tunnels Under the Old Town of Kranj, using, among other things, the Proteus as inspiration. The inspiration for the reference to the endangered Proteus came when a group of artists happened to visit the Information Centre during an inspection of the future exhibition site.

Selected press releases:

RTV Slovenia: <https://www.rtvlo.si/rtv365/arhiv/174913219?s=tv>,  
<https://www.rtvlo.si/zabava-in-slog/ture-avanture/cloveska-ribica-na-ogled-tudi-v-kranjskih-rovih/646831>

Pro Plus:

<https://www.24ur.com/novice/slovenija/v-rove-pod-kranjem-preselili-cloveske-ribice-ki-bodo-decembra-na-ogled-obiskovalcem.html>

National newspaper DELO:

<https://www.delo.si/magazin/zanimivosti/cloveska-ribica-je-za-jamski-svet-to-kar-je-lev-za-afriko-savano/>

Regional newspaper Gorenjski Glas:

[https://www.gorenjskiglas.si/supplement/i523l5t2s274v2v2t2z2b4g5b413q294m5m534t2c4c4747474b4w2x2m5s20384o2g3q494y27454r2746334l3a3c3n2r2/Kranjske\\_novice\\_20221125\\_11\\_nove.pdf](https://www.gorenjskiglas.si/supplement/i523l5t2s274v2v2t2z2b4g5b413q294m5m534t2c4c4747474b4w2x2m5s20384o2g3q494y27454r2746334l3a3c3n2r2/Kranjske_novice_20221125_11_nove.pdf)

City of Kranj press:

<https://www.kranj.si/v-kranjskih-rovih-odpri-informacijski-center-o-cloveski-ribici-sos-proteus>

The Guardian:

<https://www.theguardian.com/travel/2023/may/10/kranj-northern-slovenia-city-break>

### *Tips for other destinations*

*Your suggestions or recommendations for other destinations facing the same issues or implementing similar solutions*

We recommend that when designing and implementing innovative green tourism products, you try to rely on a transdisciplinary approach to finding all-encompassing and long-term solutions.

Due to the uniqueness of the challenges of this project (the sensitive nature of the Proteus, the harsh environmental conditions of the tunnels, the long-term public-private partnership, the pedagogy of public outreach, the information of stakeholders and public, the renovation of a technical monument, the aesthetic experience, etc.), we have gathered a transdisciplinary team that focuses on ideas in the fields of Proteus biology and nature conservation (Tular Cave Laboratory), green tourism (Board for Tourism and Culture Kranj), municipal services (departments for economic activity, smart city, PR, legal services, municipal utilities), cultural heritage, architecture, design and engineering. This is how we were able to come up with a cutting-edge presentation of the Proteus to the public, as it is most needed in these present times.

### *Recognitions and Additional references*

*Recognitions and awards the Good Practice received and supporting evidence.*

The SOS Proteus Information Centre was one of the flagship projects that contributed to two high awards for Kranj as an emerging green destination in 2023: European Destination of Excellence 2023 by the European Commission

([https://single-market-economy.ec.europa.eu/news/kranj-selected-2023-european-destination-excellence-2022-11-09\\_en](https://single-market-economy.ec.europa.eu/news/kranj-selected-2023-european-destination-excellence-2022-11-09_en)), and for our involvement in the Green Scheme of Slovenian

Tourism, we received the highest label, Slovenia Green Destination Platinum

(<https://www.slovenia.info/en/business/green-scheme-of-slovenian-tourism/members>).

The message of the SOS Proteus Information Centre is also linked to the International Certificate of Excellence, a recognition of the high quality of Kranj's drinking water, awarded this year to the City of Kranj by the Bled Water Forum for the drinking water at the fountain on the Main Square in Kranj. For more than 60 years, the Proteus, being a sensitive amphibian and bioindicator of clean water, has been living, breeding and thriving in the pools of the Tular Cave Laboratory that are fed by the city's water supply. And it is here in Kranj that the motto of the SOS Proteus Information Centre – “We share our drinking water with the Proteus” – has come to life!

The new SOS Proteus Information Centre has been featured not only in Slovenian national and local media, but also in respected international media such as The Guardian

(<https://www.theguardian.com/travel/2023/may/10/kranj-northern-slovenia-city-break>) and The Times.

The legal model of Public-Private Partnership we have developed in this project was described within Country Reports in the first issue of this year's edition of the international academic journal European Procurement & Public Private Partnerships Law Review (DOI: <https://doi.org/10.21552/epppl/2023/1/11>).





As a special tribute to our project, the President of the Republic of Slovenia, Borut Pahor, accepted his honorary patronage at the opening of the Information Centre SOS Proteus on 10 November 2022

(<https://www.slovenia.info/en/press-centre/news-of-the-tourism-press-agency/21523-sos-proteus-information-centre-on-cave-salamanders-opens-in-kranj>).

