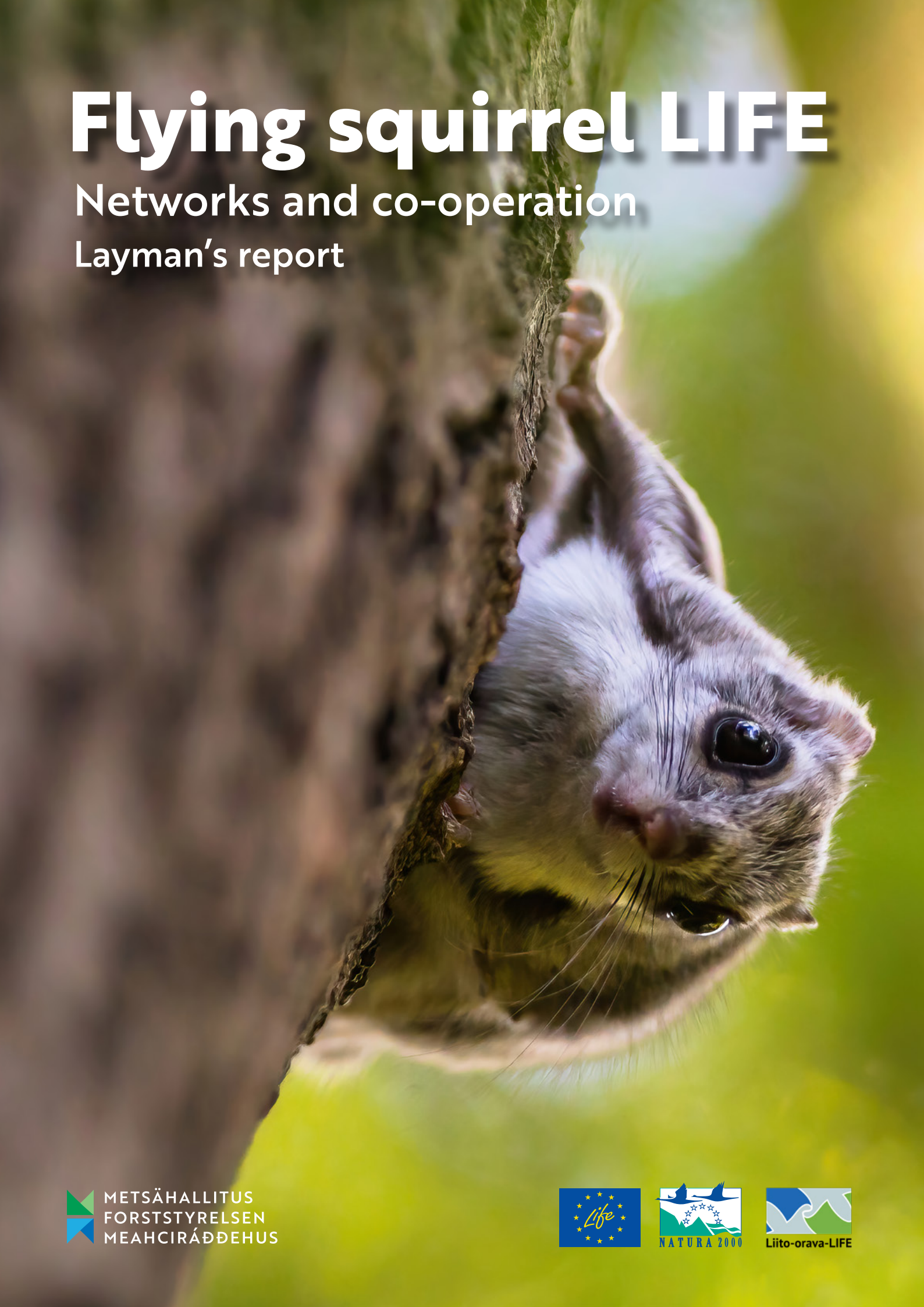
Flying squirrel LIFE

Networks and co-operation

Layman's report



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FLYING SQUIRREL LIFE (LIFE17 NAT/FI/000469)

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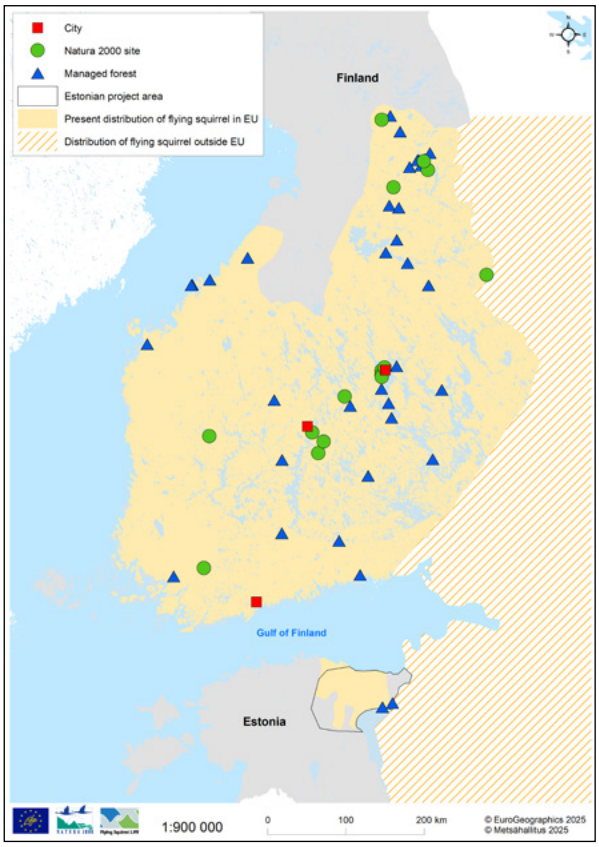
Networks and co-operation

The Flying Squirrel LIFE project improved the conservation of flying squirrels in Europe through co-operation. A strictly protected species, the flying squirrel usually inhabits mature mixed forests, which have high monetary value. Thus, conflicts of interest are inevitable. Most of the flying squirrels live outside conservation areas, especially in Finland. The solutions in forest management impact directly on the future of the species.



Project area and project sites in Finland and Estonia.

Siberian flying squirrel *(Pteromys volans)*

- A small arboreal rodent. Feeds on leaves and catkins and prefers old mixed forests as habitats. The flying squirrel moves easily in forests with trees at least 10 metres high. With the help of its patagium, it can cross small open areas and glide over roads. Older trees are big and dense enough to offer shelter from predators, hides for food and sheltered nesting holes.
- A boreal species ranging across the Siberian taiga, habiting the western borders of its range only in Finland and Estonia inside the European Union. These countries have a unique responsibility in preserving the Siberian flying squirrel.
- The population has declined due to the reduction and fragmentation of suitable habitats by forest cuttings and building constructions.
- Classified as vulnerable in Finland and critically endangered in Estonia, strictly protected in both countries. In Finland the populations are scattered from Southern Finland all the way to the southern parts of Lapland. In Estonia the flying squirrels inhabit only a small area in the northeastern parts of the country.
- However, by monitoring forest habitation regularly, it has been noted that despite conservation efforts, the population is strongly declining.

Both in Finland and Estonia, the need for combining the conservation of the flying squirrel and other goals was big. The Flying Squirrel LIFE project was constructed to gather different operators together, to mitigate different views and to make practical decisions easier.

The project did not aim at making changes in conservation legislation. Instead, the goal was to develop new good practices and share instructions in everyday land use with help of project examples. Our most important achievements are the availability and reliability of knowledge, as well as forming networks between different operators. A good understanding about flying squirrel habitats and moving connections helps in land use decision-making, even though the species itself is quite known.

How to know if there's a flying squirrel in a forest?

As a quiet, nocturnal animal that moves mainly in the canopy, the flying squirrel is a hard species to research. One way is supreme though: findings of excrement and urine traces by trees are signs of the presence of this endangered forest glider.

Being a short-lived species, the occurrence of flying squirrels in an area may vary over years. Sometimes very good habitats remain empty for a long time just because a resident has passed away and a new individual has not arrived yet.

We monitored the presence of the species regularly on the project sites throughout project years. We also organized several education events about flying squirrel inventories. Insight info from a longer period can explain reasons about the variability of occurrence.

Sniffing inventors offer help

Even though excrement finding is an efficient method in flying squirrel inventories, the feces are hard to find, especially if inventories are executed outside spring season. A great help for this comes from the world's best sense of smell – dogs! A trained nature inventory dog can recognize smaller and older traces than humans.

During the project we could prove that dogs can efficiently assist flying squirrel inventories and the know-how about using them was exported to Estonia as well.

Information for land use professionals and authorities...

In Finland, we made a monitoring tool for professional use in the **laji.fi** portal maintained by the Finnish Museum of Natural History, as well as a common info page about the flying squirrel. On this website you can find reported sights of the flying squirrel and guides made in the project. In Estonia, flying squirrel data is not public, but only in use for authorities.

In both countries we built prediction maps that illustrate suitable flying squirrel habitats and their locations. The maps have been successful in finding new flying squirrel forests in Estonia. In Finland, the prediction map layer is freely downloadable in **laji.fi** and National Land Survey site. Prediction maps help in targeting inventories and recognizing central moving connections. When areas important for flying squirrel are found in time, sustainable solutions in land use planning can be done to combine both species protection and other goals.

... and info for general public

We made a brochure and several theme videos to present the project. Livestreams from flying squirrel nest boxes broadcast in 2019 and 2020 are still available. In Estonia, we gained engagement via tv programs by the popular TV group Osoon. In addition, a whole new book was created in Estonia; Lendoravaraamat gathered the history and present state of the flying squirrel in one book.

We spread the knowledge about the flying squirrel in both countries by permanent and loanable exhibitions. Different events, such as guided flying squirrel walks and nest box building days, were popular.

New info boards about the flying squirrel were set in nature paths in Rekijokilaakso and Jyväskylä in Finland, and in Iisaku, near Alutaguse national park in Estonia. We also made a new guide for environmental education and had several school visits and nature school events.

- **74** new flying squirrel habitats found in Estonia in project inventories
- **5** guides about different themes (1 for inventories, 1 for environmental education, 1 for urban areas, 2 for managed forests)
- **4** flying squirrel exhibitons (permanent and loanable, Kuopio natural history museum & The Finnish Nature Center Haltia in Espoo), reaching over **250 000** visitors
- Over **50** nature school events, reaching over **70** classes and almost **1 500** students
- Ca. **200** flying squirrel ambassador visits, over **3 400** participants
- **130** public events (photo exhibitions, flying squirrel walks, nest box building days), almost **6 000** participants

Minding the flying squirrel in managed forests

Flying squirrels prefer mature mixed forests which often have significant economic value. Nature protection law prohibits destructing nesting and resting places. During the project we made exemplary plans for different managed forests. The aim was to demonstrate how forest management could be done carefully, without weakening the living conditions of the flying squirrel. In Finland, we had project sites both in state-owned and private-owned managed forests. In Estonia, all the project forests were private property.

In Finland, a key factor was **joint planning process**, in which professionals from forestry, nature conservation and land use authorities took part from the beginning. In Estonia we made the examples and cuttings under the environmental authorities' surveillance.

On the exemplary sites we defined the most important forest parts for the flying squirrel. We made sure that several hectares were spared, and forest management measures were more careful than usual. At some sites, no cuttings were planned if most of the area was flying squirrel habitat. In these cases, sites could be protected. Forests inhabited by flying squirrel are often favored by many other species as well, which indicates biodiversity.

Illustration: Tussitaikurit

Compiling info in guidebooks and education events

We spread knowledge of the flying squirrel for forestry operators and landowners. New comprehensive guides for forest owners were published both in Finland and Estonia. In addition to the guidebooks, tens of education events were held both online and at the project example sites.

Surveys tailored particularly for forest owners showed that the majority have a positive attitude towards the flying squirrel, but economic losses due to forest management restrictions are challenging. Many kinds of goals can be reached with good planning though.

In forest planning, the points of view need to be far-reaching. We modelled the consequences of forest management with different future **scenarios**. They can serve as support in decision-making, when aiming for both securing the environment suitable for flying squirrels and reaching economic goals in a longer period.

- **87** exemplary project sites in managed forests (private & state-owned forests, **57** in Finland, **30** in Estonia)
- **2** guidebooks for forest owners (Suomen Metsäkeskus: Liito-orava talousmetsässä & Eesti Erametsaliit: Lendoravametsade majandamine)
- **15** webinars, **53** forest educations events, over **1 700** participants
- **2** info videos about managed forest themes on YouTube (Finnish Forest Centre & Metsähallitus Parks and Wildlife)
- **Over 350** personal counselling meetings for forest owners in Finland and Estonia

Illustration: Tupu Vuorinen

Moving connections and living space for flying squirrels in urban areas

In Finland flying squirrels often thrive in city areas, because they often have parks and recreational forests suitable for flying squirrels. The biggest challenge for the species in urban environments is the breaking of moving connections between different habitats. In city areas flying squirrels move along parks and house yard trees – sometimes even single big trees might be crucial in crossing roads.

During the project, the cities of Espoo, Kuopio and Jyväskylä gathered their experiences and good practices together. All the project cities have pivotal locations in which flying squirrels need moving corridors from one habitat to another. Without moving corridors, the populations would be isolated, so these were secured by planting trees on locations sparse with them. Additionally, on two sites, specific jumping poles were erected; they help flying squirrels' moving at such places where trees cannot be planted.

Urban forests are important both for humans and flying squirrels

It is important that green areas and forests are retained in cities and managed moderately. Based on surveys made during the project, citizens often found the presence of the flying squirrel in their neighbourhood positive. Their wishes about retaining forests for recreational use match nicely together with the needs of the flying squirrel. For city planners, the survey results gave crucial info about attitudes towards the species, and careful cuttings could be planned properly.

We composed a public guidebook based on the good practices perceived during the project, for the use of other cities and municipalities.

Nest boxes and radio collars

The living conditions for urban flying squirrels can be improved by offering more safe nesting places. Old trees with suitable nest holes are rare in urban areas, so man-made wooden nest boxes offer one solution. We set over 90 nest boxes in trees around Kuopio and Jyväskylä, and flying squirrels have accepted some of them. However, retaining suitable habitats is more important than nest boxes for the species to thrive in urban areas.

Info about the moving of the urban flying squirrels was collected with radio telemetry collars. In Espoo, 10 flying squirrels were collared to get information to support city planning. We found out that flying squirrels use even very small forest patches, if safe moving connections remain between them. However, they still need larger forest areas close to these.

- **1** guidebook about good practices for cities
- **21** urban example sites on which habitat network was improved
- **9** new moving connections in Finland
- **96** nest boxes in Jyväskylä and Kuopio, in **13** different areas
- **Ca. 400** survey answerers in Kuopio citizen surveys

Nature conservation areas and future nesting trees

Aspen (Populus tremula), a key species of the biodiversity of boreal taiga, is a pivotal tree for the flying squirrel. The leaves and catkins offer food and holes carved by woodpeckers serve as nesting places. Even though aspen spreads fast to open forest areas, growing into a nesting tree thick enough for the flying squirrel might take even 80 years.

Since aspen is so important for the flying squirrel, we wanted to secure the future **aspen continuity** in the project. As seedling, aspen demands lots of space and light, so we cleared more growing space for them by cutting bigger shady trees around them. During the project, we both planted young aspens and fenced some seedlings with dog fences to prevent herbivory from elks etc. So far, the fenced seedlings have survived well, although actual results of growing into nesting trees can be seen only after decades.

New conservation areas and moving connections

During the project we established several new nature protection areas. New protected flying squirrel habitats are located around the country, from Southwest Finland to Northern Savonia and Northern Karelia, and they cover over 33 hectares of land.

In Rekijokilaakso, Salo, we held several personal discussions with landowners, resulting in permanent conservation contracts covering over 150 hectares of private land. Face-to-face meetings and discussions helped landowners understand the meaning of conserving flying squirrel habitats, and advice and meetings were found very useful. This process can be copied and applied in the future as well.

In Estonia, future moving connections from habitat to another were improved by planting tree seedlings under wide powerlines. It is a novel approach, as usually vegetation under powerlines is kept low. This is a simple and effective way to help flying squirrels to move from one area to another.

- **15** aspen continuity sites on state-owned land and conservation areas, **49** aspen fencings
- **33** hectares of new nature conservation areas
- **2** new future moving connections in Estonia (trees under wide powerlines)

Recommendations for the future

Since the beginning of the project, it was clear that no magic bullet exists that would give simple solutions for the challenges in land use and flying squirrel conservation. However, gathering several project beneficiaries and their skills together created unique new comprehension. Based on project actions and our experiences, we composed recommendations that could support the survival of the flying squirrel in the future.

After six years of co-operation, we, the project beneficiaries from both Finland and Estonia, have a comprehensive understanding and perception of the complex questions concerning the flying squirrel. Our knowledge and experiences are worth of using, as everyone worked for the same goal – to secure the existence of the flying squirrel both in forest areas and urban environments.

Recommendations for Estonia:

- proposal to the conservation law to safeguard flying squirrel nesting areas
- promoting the development of future habitats by supporting forest owners
- establishing conservation easements (volunteer conservation) and promoting innovative funding opportunities
- promoting landscape-scale planning
- developing a genetic monitoring method for population status assessment
- continuing public involvement & raising awareness
- continuing international co-operation

Recommendations for Finland:

- updating existing official guidelines
- improving guidance to maintain breeding and resting places in practice
- ensuring better knowledge and continuous learning
- increasing landscape-scale approach, also across ownership and municipality borders
- developing monitoring, data collection and research approaches
- improving practical arrangements for forest owners
- increasing environmental education

You can get along with the flying squirrel

The future of the flying squirrel will be resolved mainly outside nature conservation areas. The funding from the LIFE program enabled versatile new measures on numerous different project sites, as well as comprehensive education programs and several guidebooks. However, the flying squirrel is still an endangered species, and safeguarding its habitats will be constantly challenging. Spreading the skills and understanding is crucially important, for all the help in securing the future of the flying squirrel is needed.

See the project publications and other info on project website: metsa.fi/en/flying-squirrel-life !

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