

URBAN PRESSURE AROUND AREAS OF NATURAL HERITAGE. CENAS TĪRELIS

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Abstract. The study looks at the perimeter or ring encroachment of anthropogenic pressures around areas of natural substrate or marshland. The anthropogenic load, the intensity of which began with the invasion of the Soviet-era economic policy and the wave of migrants bringing large numbers of migrant workers to Latvia in the 1960s-80s, brought with it an alien understanding of living space, exaggerations of the scale of development, a distorted un-understanding of spatial harmony and equilibrium. Rapid settlement construction, the establishment of drainage net-works, the pace of collectivisation and agro-technology, and logging began. These are things that today are being increasingly controlled in the spatial plans of municipalities. To maintain the sustainable development of the natural base, it is necessary to look for ways of bringing residential areas closer to it, without reducing the ecological status. The settlements of the 3 districts of the Tīrelis of Cena are examined in more detail, where the 19th–21st centuries are described. transformation processes.

Keywords: natural base, anthropogenic load, spatial structure, multi-storey residential development

Introduction

The study covers issues that are becoming increasingly topical as the pressures of urbanisation draw closer to both the natural substrate and the historic cultural space. This is most evident in the impact of metropolitan agglomeration, with the emergence of a number of settlements or so-called satellites with their own infrastructure and public space character, and which have an undeniably strong prospective development prognosis. The study therefore draws attention to the search for a balance in the development plans of municipalities, so as not to undermine the identity of the area and its sustainability [2]. A striking example is the Cenas Tīrelis and the Black Lake marsh, which are in close proximity to the Riga agglomeration and whose eastern edge is being increasingly encroached upon by the 20th/21st-century development of the Cenas Tīrelis and the Black Lake marsh. The area is also the site of a number of new and growing anthropogenic developments, such as residential areas, and industrial and warehousing zones, including peat extraction in the marsh. Undeniably, the area of Tīrelis can successfully serve as a recreational area (bog footbridges, berry picking, mushroom picking, flora identification, etc.), creating the so-called urban or urban forest character [4].

During the Duchy of Courland in the 17th/18th centuries. In the 17th century and 17th century of Courland, land roads with several churches, small manor houses and roadside inns developed around the Tīrelis marsh of Cena. The spires of the historic churches were still visible as vertical dominants in long sight lines in the 1950s/1960s. In the post-war years of the 1970s/1980s, as the intensity of development increased, new buildings encroached more closely on the cultural space, obscuring the dominance of the historic buildings.

The study aims to reflect on the 20th/21st century. The development of the urban load alongside the natural base area.

Research objectives:

- suppression of the visual expression of cultural and historical values along the outer edge of Tīrelis (old roadside trees, churches with cemeteries and parsonages, taverns, memorials of the fallen in the Freedom Struggle);
- studying the increase in density and intensity of high-rise buildings;
- the retreat as an educational space (marsh boardwalks,

recreation, educational places), with the emergence of urban (city) forests “entering” the urban space;

- the search for cultural and historical space and the context of the uniqueness of Tīrelis – as emotionally powerful criteria (swamp wells, sand dunes, pine forest, woodland, church silhouettes);
- transformation processes and visual-aesthetic quality.

The study uses a comparative method, based on research of archives and historical documentation. It also uses a photographic method and takes into account the main sight lines and points in the existing situation. The graphic method provides additional information for a more in-depth presentation of the issues.

The relevance of the topic covered in the study is related to the intense rate of new low-rise housing developments, which are approaching the Tīrelis areas or Natura 2000 uniqueness. As the quality of life and comfort of the population increase, there is a growing desire to live closer to nature [3]. The proximity of the sea, the marsh boardwalks, berry picking, mushroom picking, moving away from the emotional everyday rush of the big city.

The research work is related to the search for harmony and synthesis and includes the characteristics of the natural substrate, the development opportunities of urban forests and the contextualisation of

settlement infrastructure. The above is addressed by selecting the Cenas Tīrelis area, which is located 2km from the low-rise buildings of Jaunmārupe, Babīte and Olaine and 3km from Riga Airport.

“The urban forest is a natural or man-made ecosystem in all its stages of development, and whose current potential tree canopy projection is at least 20% of the area covered by the stand. Forest serves as public open space within and outside the urban administrative boundaries of cities in an urban environment where the primary social and environmental functions require regular maintenance and restoration, preserving or enhancing the social, aesthetic, cultural, historical and economic value of the area’ [4].

These include Natura 2000 sites, managed by the state or municipality, and are popular recreational areas, blue-green structures, and specially designed infrastructure. This also includes the Cenas Tīrelis and the adjacent Black Lake Marsh.

The assessment of landscape change processes under mod-

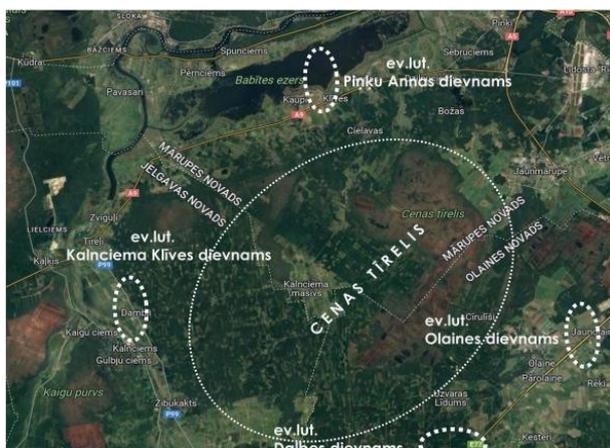


Fig. 1. Cenā Tīrelis with perimetral sacred landscape [authors' scheme]

ern anthropogenic pressures is related to several functions: social, environmental education, nature conservation, aesthetic, economic, and emotional well-being criteria definition [4].

Materials and Methods

The transformation processes in the landscape, as mentioned above, around Cenā Tīrelis in the 17th century. The land roads along the Lielupe River to the sea and to Riga, bypassing the marshland along its western and northern sides, began to form in the 17th century.

Nowadays, after the administrative-territorial reform, Tīrelis is located in 3 municipalities – Olaine, Mārupe and Jelgava. This imposes a serious task on these municipalities to maintain the load of balance brought by the 21st century. Urbanisation processes. The eastern part of the Tīrelis territory is located in close proximity to the Riga agglomeration, which creates a rapid rhythm of economic pulsation. Tīrelis is located between 3 national motorways – N-S direction Jelgava – Kalnciems, D-DA direction Jelgava–Rīga road, R-A direction Liepāja – Rīga road.

In the early 20th century, the location of places of worship was important for rural people. Christianity as the most important thing in a person's life. The distance to the church meant the distance to be travelled every Sunday to worship. Especially in winter, on a sledge path across a frozen bog. Our daily life and our relationship with sacred values have changed over the centuries.

In the northern part of the Tīrelis of Cena - St. Anne's Church of Pinki (second half of the 19th century, architect J.D.Felsko) (15). With the construction of the new Liepāja highway, the historical sight lines have been lost, as they are covered by dune vegetation. A modern office building has been built just a few dozen metres from the altar. The picturesque avenue of historic trees in the northern part of the dune is not visible. A fragment of the old Liepāja road with its large trees along the rectory and the part of the park with the Džilnupīte River has been preserved. The farmsteads have been replaced by dense detached housing.

On the eastern edge of the Cena Tīrelis – St. Elizabethes Ev.lutē Church (18th century, architect J.H.Giterboks). After the war, the church lost the elegance of its bell tower spire. A dense housing estate has developed around the church and the old trees. The site of the historic dirt road is preserved by some 200–250-year-old oaks, lindens and larches.

On the southern edge of Tīrelis – Dalbe church (mid-19th century; arch.N.Gusevičs) – preserves the historically spatial character of a rural church with a cemetery.

On the western edge – Kalnciema Klīve Evangelical Lutheran Church (19th century; arch.E.J.Strauss) with the burial place of



Fig. 2. The old dirt road to Riga along the Olaine church
 Fig. 3. The silhouette of the Olaine church at the beginning of the 20th century



Fig. 4. Kalnciema-Klīve Lutheran Church with cemetery field for German soldiers
 Fig. 5. Olaine church 19th/20th century [Rundāle Palace Museum]



Fig. 6. St. Anne's Ev.lut. Pinki Church [15]
 Fig. 7. Ev.lut. Dalbe Church [https://www.visit.jelgava.lv/apskates-objects/churches-and-monasteries/item/158-dalbes-lutheran-church]



Fig. 8. Victory Pike. Establishment of a ditch system for clearing fields in the 1930s 20th century
 Fig. 9. Victory Pike. Ditching through the forest in the 20th century 1930s



Fig. 10. Victory Pike. "Silenieki" houses, 1930 [https://www.lsm.lv/uz-varas-lidums#rec665404277]



Fig. 11. Victory Pike. "Lidumnieki" houses, 2023 [https://www.lsm.lv/uz-varas-lidums#rec665404277]

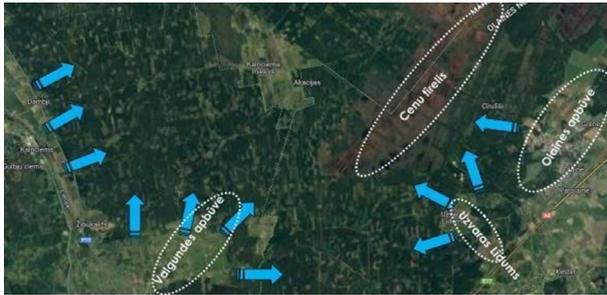


Fig. 12. The western part of Tīrelis (Valgunde parish) and the southern edge of Tīrelis (Victory Pike). Anthropogenic load directions [authors' scheme]

German soldiers killed in World War I.

The urban load in the area of Tīrelis bog dates back to 1936, when the "excavation" of the southern edge of the bog began. The First Free State of Latvia, after the Freedom Struggle, was distributing land to new farmers. Many Latvians wanted land and there was not enough of it, so part of the marshland was cleared. One of them is the above-mentioned Tīrelis bog. The recovered land was called Victory Pike, which was intended for a typical rural settlement of 250 hectares. "The land was deforested for 16 medium-sized model farms and one forester's house. First, trees and shrubs were cut down, stumps were broken, and then 160 workers cut down the firewood trees and left them for the next owners. After that, 70 men dug a drain by hand, which led the swamp water to the Misa River. The main channel was a grandiose 3.5 metres deep and 11 metres wide, in an overgrown marshy area. A considerable amount of money was spent on deforestation and drainage system. It was estimated that the vast Riga-Jelgava marsh area, covering about 300 km², could yield about 260 million tonnes of dry peat. This bulk could provide Riga with 100 years of fuel material. There is a lot of unusable land that can be turned into fertile and flowering wastelands or forests. Cultivation of unsuitable land will provide work and bread for many new farms, and this will be a blessing for the whole Latvian nation" [5]. Today, in order to ensure quality management of the Tīrelis forest, the so-called Church stiga has been created alongside the forest area on the western edge of the Victory Pike, which forms an emotionally powerful link between two cultural and historical spaces – the Dalbe church and the historic village area. The south-eastern edge of the Tīrelis is spatially closed by the road and the railway Jelgava–Rīga. The historical dirt road to Riga existed until the 19th century. It was located away from the southern edge of Tīrelis. This is evidenced by the old roadside trees as the road passes closely by the Evangelical Lutheran church of Olaine (St. Evangelical Lutheran Olei - German). The church was built on a sand dune and could be seen from a distance. In 1830–1857, the new Riga-Yelgau dirt road was built through Olaine with a horse post station. In 1868, during the Russian Governorate, the Riga-Jelgava railway line was built, which served the Germans particularly well during World War I, while the adjacent Cenas Tīrelis guarded the Latvian Riflemen's defence line during the Battle of Freedom. Two important trade arteries, the highway and the railway, which united with Western Europe, brought new stigas, alleys, rows of trees, bridges and view lines to the churches. On the western edge of the Tīrelis, the Evangelical Lutheran Kalnciema-Klīve Church has preserved its historic sacred landscape.

Results and Discussion

When studying the territory of Tīrelis in more detail, the part of Tīrelis belonging to each municipality differs both in its geomorphological structure and in the intensity of the anthropogenic pressure, which was most pronounced in the 1960s–1980s under the influence of the state economic pol-

icy. Several areas of anthropogenic pressure can therefore be mentioned around the perimeter of Tīrelis: In the west, the village of Valgunde, which developed as a collective farm centre with agricultural tendencies; In the south, the Victory Pike, with the development of agroindustry and forestry; To the east – Olaine urban area with high-rise residential buildings and a strong industrial area; to the north – several detached housing areas belonging to Mārupe and Babīte parishes, as well as the construction of the new Liepāja-Rīga motorway, which created several sand quarry sites in the immediate vicinity, digging up sand dunes. Each of these areas has a different origin, intensity and spatial composition in the 1960s–1980s. However, they all share a perimeter around Tīrelis and its characteristic natural features of the substrate – early frosts in autumn, late frosts in spring, high humidity, freezing air in summer, soil with high acidity, low fertility in the sand dune zone, differences in relief.

Western edge of Tyre

The western edge of the Tīrelis is covered by the Langer Wald forest belt, which runs parallel to the Lielupe riverbed and connects the Zālite forest massif with the Ķemeri Tīrelis forest (Langer Wald - German). Part of the territory belongs to Jelgava County, which is occupied by Valgunde Parish with about 1.6 thousand inhabitants. The municipality has 6.6 inhabitants. It is a lowland of the Seaside and lies 3–4 m above sea level. The parish is dominated by sandy plains, but there are also some dunes and dune ridges. The highest point in the municipality is Ložmetējkals – 33 metres above sea level. In general, the parish has a rather large variety of landforms. The southern part is very flat, there are no large hills or elevations – a typical Zemgale landscape. The northern part is rich in dunes, dune ridges, hills and elevations. The municipality has peat reserves, some of which are exploited industrially. The forest areas are of great value. The forests are mainly pine – 70 %, birch – 25 %, spruce – a little. Valgunde village as a settlement was formed by the establishment of a kohoz in the 1950s with wide streets and ditches, and fragmentary tree plantations. There are also drainage ditches connected to the Tīrelis forests. The village of Valgunde is linked to the nearby former Tīrelli Forest. The village of Valgunde is close to the nearby Valgunde Manor (Vollgut;Wolgunt – German) on the banks of the Lielupe River. The spatial composition of the village is based on an axis which is linked to the site of the former manor house on the banks of the Lielupe, thus forming a distinct perpendicular to the shoreline. It is the central street of the village, which forms a distinctive blue/green spine of the development, connecting the Lielupe River with the Tīrelis woodland [13].

South-eastern area of Tyre

The south-eastern edge of the Tīrelis is the strongest anthropogenic pressure because in the 20th century, the Tīrelis was under the influence of the sea. In the 1960s–1970s, the construction of Olaine began, creating a Soviet-era exaggerated scale of typical reinforced concrete buildings and the intensity of industrial areas. Olaine has its origins as a small settlement of peat diggers with few buildings. This can be attributed to the adjacent 19th century 1960s–1980s: a railway and an earth road, enabling the onward transport of peat briquettes. The Tīrelis area contains rich peat layers and in 1939 the peat industry began to develop in earnest, with workers employed on the bog and in the peat briquette factory [8]. In 1940, the first apartment house was built on an empty site for the Tīrelis peat diggers during the first Latvian Free State, to serve the needs of the peat factory. The two-storey stone house with stove heating and comfortable rooms. It is the only building that has survived to the present day, renovated and has in-



Fig. 13. Olaine peat factory workers' village barracks, 1951 [OVMM archive]
 Fig. 14. Village street near barracks and some trees, 1951 [OVMM archive]



Fig. 15. The western edge of Tīrelis with the Lielupe floodplain and the long axis of Valgunde Manor [authors' scheme]



Fig. 16. Multi-storey residential buildings in Stacijas Street, 1971 [OVMM archive]
 Fig. 17. Typical school building in T. Zeiferta Street, 1970s [OVMM archive]



Fig. 18. Gastronomy shop Zemgale street 1970s [OVMM archive]
 Fig. 19. Cinema building 1970s [OVMM archive]



Fig. 20. Meadow between Tīrelis forest and railway, 1970 [OVMM archive]
 Fig. 21. High-rise residential development in the former meadow area, 2022 [photo by authors]



Fig. 22. Construction of a treatment plant at Tīrelis Forest, 1970s [OVMM archive]
 Fig. 23. High-rise residential development, 1990s [OVMM archive]

dustrial heritage value. The name of the street, Kūdras Street, and several old buildings exist today as historical evidence. Between July 1940 and June 1941, several barrack-type buildings were built for the workers in the peat bog. In the post-war years from the 1950s onwards, the transformation of the Olaine landscape began a rapid urbanisation process, which was continued by a large-scale industrialisation process. In 1949, after the deportation of the population and the wave of migration of the eastern peoples, an alien understanding of living space flowed in. The construction of sleeping barracks developed. The small buildings housed at least 40 people with a shared kitchen, dry toilet and narrow beds. Even larg-

er numbers of Soviet citizens were brought in to build the city and later to work in the factories. According to the 2021 census, out of a total population of 10 324, 4 312 (41.8 %) Russians, 4 126 (40) Latvians and 1 886 (18.2 %) other nationalities lived in the city.

From 1956 to 1960, 2-storey apartment houses were built in Olaine along Kūdras Street and Zemgales Street. The intensity of the industrial load also contributed to the pace and quantity, rather than the quality, of residential development. Peat briquettes as fuel material for war-torn Latvian towns were a very important contribution and support to Latvia's industrial development. Today, it is an industrial heritage story for the city. In the 1950s, Olaine was home to the glue and gelatine factories, a prison with prisoner employment, and the chemical and pharmaceutical industries. The level of ecological balance of the natural substrate, the Cena Tīrelis, was a secondary concern in the post-war years. The historic 2-storey buildings of Zemgales Street are still legible today, as they preserve the character of the old workers' village: the simplified form of the buildings with shuttered windows, the symmetrical position of the external doors, the giant chimneys, the inner courtyard, the parallelism of the buildings. The street structure does not show avenues or rows of trees (lindens, oaks), which was an important criterion in urban planning. Only individual birch trees are visible. This is a good description of the Soviet-era tendencies in urban planning and the introduction of a foreign mentality in Latvia after the deportations of the population in the 1950s.

Scale and intensity of population Olaine is characterised by modified natural landscapes: a typical urban landscape of high-rise residential and industrial areas, a road scape, a forest and marsh landscape, peat quarry sites, some of which have been adapted for small gardens, a marsh ditch adapted for an urban canal with a green belt. The above clearly demonstrates the development of anthropogenic pressures. However, it is also possible to obtain feedback by bringing the 'blue' veining of the Tīrelis (small marsh streams and ditches) into the urban space and giving it an aesthetically high-quality appearance. Olaine's infrastructure forms part of the Riga outer urban agglomeration area. By encouraging the urban development to have the character of a forest park, such a blue/green urban character can create a very strong upward trend in demand for residential space in the vicinity of Riga.

In the 1960s–1970s, the city's buildings included typical 5-storey, 9-storey residential buildings, kindergartens and schools, a cinema, a department store, a hospital. The proximity to Riga encouraged the development of industrial areas, with buildings encroaching into the approximately 1km of the Tīrelis forest. The proximity of the new Riga airport and the metropolitan infrastructure in the 1960s-1980s contributed to the expansion of the areas towards the conservation area [1]. Growing chemical plants increased the demand for workers, resulting in a population increase of 2000 between 1965 and 1967, and 11 apartment blocks were built in the new town within two years [6]. The further development of the town was closely linked to the development of the factories. It was natural that the construction of the town continued on the higher ground - the narrow strip of land along the Riga-Jelgava railway line. It was not possible to build towards the factories because it was necessary to leave a 'green belt' between the factories and the residential area [11; 12]. In the 1960s-1980s, as residential housing developed, the areas of small gardens grew, providing food for the city's industrial workers. The existing bed of the Olaine River became a nuisance for the rapid multi-storey residential development, so its underground bed was fragmented. The river was giv-

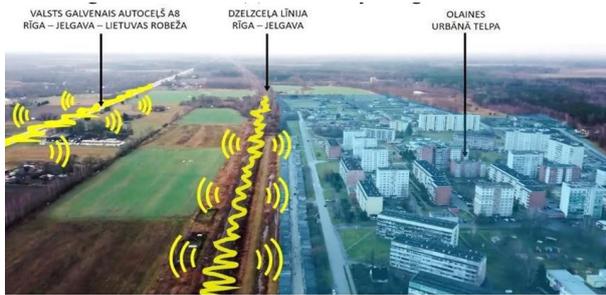


Fig. 24. Spatial parallelism - road, railway, residential area and Tīrelis forest [E.Vanaga, 2022]

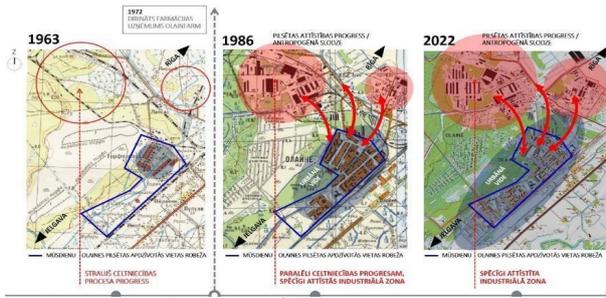


Fig. 25. Large-scale development of Olaine's industrial areas [E.Vanaga, 2022]



Fig. 26. Transformation processes of the Olaine river - an urban canal [E.Vanaga, 2022]



Fig. 27. Olaine river - an urban canal, 1970s [OVMM archive]

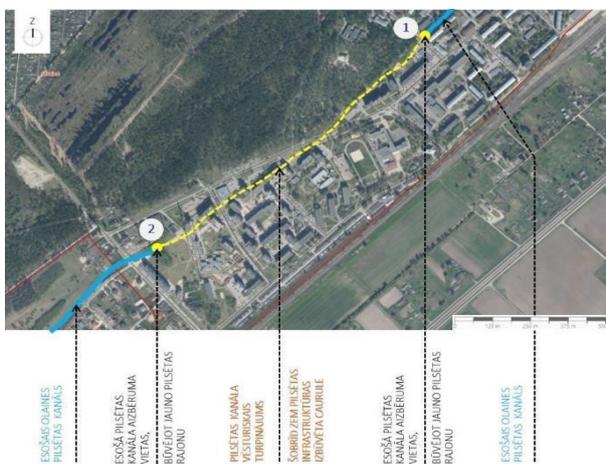


Fig. 28. Transformation of the Olaine river - city canal [E.Vanaga, 2022]



Fig. 29. Olaine river - city canal in nowadays [E.Vanaga, 2022]



Fig. 31. Tīrelis wetlands [https://www.rigasmezi.lv/lv/mezi/par_meziem/facts_/ en a concrete bank, visually resembling an urban canal [7], crossed by bridges.

Geomorphologically, the relief of Olaine is formed by the accumulation plains of the Baltic Ice Lake. The flat relief is interrupted in some places by dunes, which are reinforced with forests. As the ridges of the dunes obstruct the water runoff, marshes have developed on the plain. The 170 ha Bluku bog is located close to the town. A separate feature of Olaine's blue-green structure is the city centre drain, which is further fed into a closed collector. In most parts of the area, runoff conditions are difficult and the ground is waterlogged, and raised bogs are widespread. In the northern part of the town there are swamp forests with their characteristic zones – reedbeds, swamp forests. Forests cover 31 % of the city territory. The most biologically valuable forest is the forest stand directly adjacent to the industrial zone next to the factory A/S "Olainfarm". A small fragment of pine forest has preserved its natural structure and a plant species listed in the Latvian Red Data Book, the annual milfoil (*Lycopodium annotinum*), has been found there. The species is also listed in the Baltic Red Data Book. The Olaine municipality spatial development plan states that "Cenas Tīrelis and the adjacent Black Lake Marsh are two Natura2000 sites – as specially protected nature areas. The natural values of the nature reserve – although part of the bog is used for peat extraction, the area is of outstanding importance for the protection of raised bogs, transitional bogs and dystrophic lakes. It is one of the few bogs in Latvia that has characteristics of both eastern (*Betula nana*, *Chamaedaphne calyculata*) and western (*Trichophorum caespitosum*) bog types. The area is also important for bird conservation, with 10 bird species protected in Latvia and Europe. According to the nature conservation plan, the greatest natural value of the area is the low human impact raised bog with transitional bog fragments, which includes ecologically diverse elements of the spatial structure of the landscape – swamp forests, bog lamas and acacia, open bog or moorland. Small areas are covered by scrub, forest stiles and roads, and ditches of various sizes. Due to the established drainage network and contour ditches, the natural contact zones between marsh and forest, or marsh and meadow, are practically non-existent. The drainage ditches, which drain large quantities of water, alter the natural hydrological regime, which has a significant impact on wetland habitats and reduces their biological value. Such undesirable changes may threaten the sustainable existence of the wet-

land complex. The nature management plan also mentions human traffic as a factor affecting the site, as the site is relatively close to populated areas, including Olaine, and the site is well accessible, which poses a potential threat to the more sensitive habitats and species (by scattering, disturbing birds) that are located within the nature reserve. The anthropogenic pressure can be reduced with the installation of appropriate infrastructure and regular management, as the area is widely used as a place for recreation, berry picking and mushroom picking. The existence of a fire risk due to peat extraction in the vicinity is also mentioned as a hazard [11; 12].

Conclusions

Nature conservation plans, site management measures, nature reserves, development of recreational infrastructure are important criteria for balancing natural areas with adjacent urbanisation processes. The study area – Cenas Tīrelis and its adjacent areas – is very intensively filled with information which is only partially known. The site is located near the Riga agglomeration. Olaine has historically existed as a rural settlement with a few farmsteads on the edge of the marshland. In the post-war years of the 1970s, rapidly losing its scale and identity, prefabricated concrete panel housing entered the vacant territory, the courtyards of which were designed with exaggerated asphalt concrete pavements – passable, draughty, without trees, shrubs and compositional elegance. The picturesque coniferous forest adjacent to the urban space of Olaine forms a strong expression of the green structure. The forest has a marshy character with small ditches and tussocks. This provides an opportunity to bring or continue the wedge-like character of the natural substrate into the urban space, with a compositional play of blue-green structure.

- The western edge of Tīrelis, where the compositional-spatial axis of the Valgunde village is located, connecting Tīrelis forest and the Lielupe river bed at the former site of the village of Tīrelis. The area between the Valgunde River and the Valgunde River, which connects the Valgunde River with the Valgunde River, the Valgunde River and the Valgunde River, provides an opportunity to improve the level of visual and aesthetic quality and to create a continuation of the natural base and urban space between the Lielupe River, the western edge of the Tīrelis Forest and the adjacent Ķemeri Tīrelis Forest.
- The south-eastern edge of the Tīrelis, which is characterised by a high density of development for the town of Olaine, creates an opportunity to create an urban forest, respecting the Natura 2000 criteria. The marsh footpaths (4 km), observation towers and outdoor terraces for educational conferences raise the awareness of the population about the importance of green areas for the quality of life of the urban population.
- Prices for the Northern edge of the Tyrol in the 21st-century beginning of the 21st century. In the first half of the 21st century, detached housing areas have developed in the territories of Babīte and Mārupe municipalities, with a spatial structure of high aesthetic quality, incorporating flat areas, hills and pine overgrowth in dune areas. The compatibility of the architectural form of the streets and buildings of the villages, which are plastically solved, is to be assessed positively.
- As one of the strong elements of the natural base, Cenas Tīrelis encourages people to connect more closely with nature - walking footbridges, bird-watching towers, a reflection of the historical sites of the Battle of Freedom - trenches, blinds, drape fencing scissors; industrial-technological cognition - peat extraction, peat pans; observation of natural phenomena - frost, fog, snow-

falls, spring floods, summer wetlands, peculiarities of tree species in forest forests, bird migration, etc.).

- Very careful consideration must be given to sight lines to ensure that the dominant features of the historic buildings are not lost. This is especially true for the sacred landscape with cemeteries and old roadside trees.

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