

# The public use in Gauja National Park



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## 1. Background and aims of this study

### 1.1 Aims of this work

The main aim of the present work is to make a scientific assessment of public use in Gauja NP in order to know its reality, with the ultimate aim of helping to manage NP's public use sustainably, thus facilitating the conservation of its natural and cultural resources.

### 1.2 Background

The current PUA is done under EUROPARC-Federation's new "Working for Nature, Nature for Working" (W4N) project, whereby 12 young European conservationists are funded to develop practical job within different European protected areas along 2008. Results of these jobs will be presented at an international seminar to be held in Podyji NP, Czech Republic, in October 2008.

Funding is generously donated by the German Federal Environmental Foundation (Deutsche Bundesstiftung Umwelt, DBU).

Gauja NP belongs to the EUROPARC-Federation since 1994 and participates in the W4N project since its beginning, in 2008. It chose a young Spanish specialist in protected areas to carry out the assessment of the public use in the NP as well as to help managers with different daily tasks during the duration of W4N's pilot internship: 3 months.

The development of a research on PU in Gauja NP responds to both, the interests, aims and objectives of Gauja NP's Administration, and also to the interests, experience and profile of his main developer: a Spanish PhD researcher specialised on protected areas.

In fact, this work focuses on Gauja NP's Administration's main aims, which are<sup>1</sup>, in the first place, to preserve natural and cultural features within its territory and secondly, to promote nature tourism and sustainable development.

The present work will help to achieve up to half of the long-term Gauja NP's Administration's main objectives (6/12), as stated in its 1999 management plan:

-Secure the maintenance of nature resources and their continuous using, promoting long – lasting regional development.

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<sup>1</sup> According to the NP's Management plan.



-Ensure the development of sustainable tourism, creating recreation possibilities and employment for local inhabitants in tourism service enterprises.

-Try to balance the requirements of nature protection with sport activities and resting place organisation managed by local communities.

-Ensure maintenance and systematisation of the information about nature values and resources, cultural heritage, processes in the nature and in urban areas as well as about changes in the environmental policy and normative about the environmental protection in Latvia and the world.

-Ensure the public being informed about the Gauja NP goals as well as of the role of the Park administration and other institutions in reaching them. Add to public knowledge about the nature and culture historical values and their protection.

-Gain international evaluation and recognition of the Gauja NP nature and culture historical values.

### 1.3 Methodology

In order to analyse public use in Gauja NP, **5 parameters** about visitors **were examined**:

- a) *Number of people.*
- b) *Origin.* 3 distinctions were made: Locals (coming from towns or villages belonging totally or partially inside the Park); Latvians; and Foreigners (noting down the country of origin).
- c) *Motivation of visit / main activities carried out.*
- d) *Average expenditure in the NP.*
- e) *Satisfaction with their visit.*

The sampling included short questions to visitors entering the three NP's visitors centres (Sigulda, Cesis and Zvartezis) during four complete weeks on August 2008, starting on Monday the 4<sup>th</sup> and finishing on Sunday the 31<sup>st</sup>.

Survey was carried out 3 days a week, on two non-consecutive labour days –Tuesdays and Fridays- and also on one weekend day –Sundays, which are supposedly the busiest weekday-. 30 surveys per visitor centre and day were done. The first idea was to carry out the survey along all visitors' centres working hours (9:30-19h), but lack of enough staff and saturation of visitors in certain days, made it advisable to do only 30 since the opening hours till they were fulfilled.



A short questionnaire was prepared to be filled in either by the visitors centres' staff after asking visitors, or by visitors directly, after being asked to fill them in by the staff. The full questionnaire can be consulted in Annex 1. It included 4 brief questions about *number of people* visiting the Park, about their *origin*, their *main motivation* to visit the Park / main activity carried out during their visit, and about average expected *expenditure* in it. They were produced both in Latvian (for Latvians) and in English (for foreigners).

An introduction to the questionnaire aimed at explaining the survey to the NP's staff developing it, as well as detailed instructions, both also in Latvian and English, to carry it out were also produced and distributed. They can be consulted in Annexes 2 and 3, respectively.

All responses were collected and analysed during September 2008, and results are shown in this report.

A trial survey was made on the 28<sup>th</sup> July – 3<sup>rd</sup> August week (on Tuesday the 29<sup>th</sup> and on Sunday, the 3<sup>rd</sup>) to test its understanding and correct possible errors prior to the development of the intended survey. To do so, the three visitors' centres were visited on Monday the 28<sup>th</sup> to explain and give instructions to the staff carrying out the survey. 20 questionnaires per visitor centre were also delivered in order to test the validity of the survey. Results from this previous analysis showed that there were not problems of understanding both versions of the questionnaire (Latvian and English), except when asking about choosing *the main* motivation for their visit, which was sometimes filled in more than once. However, this was allowed along the survey, as motivations to visit the NP can be very diverse at a time.

Additionally, *a fifth parameter was analysed: visitors' satisfaction*. To do so, an on-line survey was made available on the NP's website's versions: Latvian and English, so visitors could show their satisfaction or dissatisfaction with different aspects of their visit to Gauja NP (see Annex 4). Results received from it from August the 11<sup>th</sup> till September the 10<sup>th</sup> were analysed and incorporated to this report.

To analyse insight aspects of public use in the NP, such as the existence of plans or programmes or the quantity and quality of resources available to the NP, as well as to obtain some characterization data about the NP, interviews were made to different NP workers, including technicians, specialists, managers and deputy-directors. Some information was also taken from the internet or was made available through internal or local publications by the NP's staff.

The descriptive part of this document was done out of available information, both public and internal documents (see references), as well as of internet and NP's staff's provided data.





## 1.4 Limitations

The development of such work, though useful, was challenging. It faced some **difficulties and limitations** which will inevitably affect its results to a certain degree.

The first of such limitations is time. The whole time to carry out the project was restricted to 3 months (from the 1<sup>st</sup> of July till the 26<sup>th</sup> of September). This limitation impeded to develop a desirable whole-year survey whereby to compare variations in origin, expenditure and activities carried out by visitors to the NP<sup>2</sup>.

Nevertheless, the months where research was undertaken were probably among the best ones to assess public use in the NP, as they encompass the summer period, where weather is usually benign and where most people enjoy their holidays. All these two factors encourage public use and make summertime -and early autumn- the busiest period with regard to visits to the NP.

The second limitation was means/logistics. The circumstance that the research was developed only by one person –although with the help of different NP`s workers- and that the dimensions of NP are huge –over 91,000 ha- made survey based on estimates the only accomplishable way to develop it.

Estimates are often used in scientific works of this kind, as no other way to assess this kind of data with more accuracy has been developed, though the data they provide should be treated always with a degree of uncertainty.

In this work, two types of uncertainty related to the used sampling method should be noticed. The first type deals with time and the short-term surveying period, restricted to one month –August-. The second type of uncertainty deals with sampling places, restricted to the three existing visitors centres.

Another limitation of the study was the low degree of visitors` participation on some surveys –as the on-line satisfaction survey-, which made interpretation of these data highly delicate and results not representative of the visitors` collective, just indicative.

The last limitation to the development of the work, but a very important one, related to language. The fact that the author very little knew local languages -Latvian and Russian- made it very complicated to communicate not only with visitors, but also with many NP`s workers. It also limited comprehensible information about the NP –out of the abundant available one- to a few documents and brochures.

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<sup>2</sup> NP`s Administration has data on number of visitors throughout the year.



## 2. Introduction to Gauja National Park

Gauja National Park (Gauja NP) is one of the largest and most famous protected areas in Latvia. It was established in 1973.

Nevertheless, Sigulda and the Gauja River valley –the most famous parts of the Park– have been favorites of tourists since long ago.

Since the 19<sup>th</sup> century, this area was also often visited by naturalists. It is likely that the vicinity of Sigulda has been one of the most studied nature areas in Latvia.

Like the majority of the national parks in the East Baltic, Gauja NP includes practically untouched nature areas, historically formed rural landscapes and significant monuments of antiquity. The territory of Gauja NP covers 91,745 ha.

The area of the Park forms an irregular belt that is shaped by two factors: the configuration of the ancient Gauja valley itself and artificial borders, that is, roads connecting the Park's borders on the Gauja valley.

The diversity of its nature is one of the most exceptional features of Gauja NP, which stems primarily from the diversity of abiotic factors: relief, soil, meso and microclimate, and the diversity in hydrological conditions.

Gauja NP is covered under the CORINE project. The whole Park is distinguished as a Natura 2000 site and as an Important Bird Area.

It is a member of the EUROPARC-Federation since 1994.



The river Gauja, with Turaida's castle at the background.

### 3. Social context

**3.1 Location**  
Gauja National Park is located inland, some 50 km north-east of Riga and about 20 km east from the Baltic Sea.

Sigulda, one of its main towns and where main visitors and administrative centre is, is situated on 57° 09' 19.66 N and 24° 51' 26.22 E.

Gauja NP forms an isosceles triangle of approximately 70 x 70 x 30 km, encompassing 91,745 ha. Its perimeter is enclosed by two highways: A-3, to the north, and A-2, to the south.



Figure 1. Location map of Gauja National Park



## 3.2 Social and economic framework

### 3.2.1 History

The Finno - Ugric tribe of the Livs arrived in the Gauja valley in the 11th century. Legends and documents tell us about a number of fortified wooden castles, including the Satesele, Turaida and Kubesele castles. The Livs used these to fight back against German Crusaders. We know of seven Liv castle mounds and a number of burial grounds in and around Sigulda.

Once the Crusaders had completed their attack, the local land, in 1207, was divided up between the Order of the Brethren of the Sword and the Riga bishop Albert. The order built a brick fortress called Siegewald ("Victory Forest" in German) on the left bank of Gauja, and its function was to protect the border between the order's territory and the lands of the Riga bishopric across the river. A tradesmen's village sprang up around the fortress, and a brick church was built. A papal ambassador called Wilhelm in 1266 established the Christian congregation.

During the Livonian War (1558 - 1583), Sigulda was sacked twice by the Russians. The last master of the Livonian Order, Gotthard Kettler, swore fealty to the Polish - Lithuanian Empire in 1561, thus seeking protection from Ivan the Terrible. Vidzeme became a part of Poland, and Sigulda became a provincial capital. The town was sacked once again during The Polish - Swedish War (1600 - 1629). The castle lost its importance as a military fortress and instead became the central building of a baronial estate. A variety of ancillary buildings were built near the main castle, and a residential building known as the New Castle was put up in 1881.

Sigulda began to flourish in the late 19th century when the Riga - Pliskau road and the Riga - Valka railroad were installed. The dynasty of the Kropotkins developed Sigulda into a recreational area that was popular throughout the Russian Empire. Convenient links to Riga led to herds of tourists. People could hike the so called "Alpine trails" inspect castle ruins and caves, take rides in horse - drawn wagons, and ride down the Kristin family's bobsled track.

During World War I many of the wooden buildings in Sigulda suffered serious damage. These buildings had been put up to resemble the style of structures in the Swiss Alps. During the period of Latvian independence, the baronial estate was confiscated, and the central building was turned over to the Latvian Association of Writers and Journalists, which set up a recreational facility there. After 1923 all building in Sigulda was governed by a city plan, which regulated the size of building lots, the direction in which street must run, and the establishment of parks and squares.

During World War II, Sigulda once again suffered major damage. The railroad station, a bridge across the Gauja and an open - air stage were all destroyed. The development plan that was elaborated by Soviet authorities in 1946 spoke to the creation of new foundations for Sigulda's economic growth, promoting local industry and communal construction. Sigulda became the administrative, economic and cultural center for a small region between 1950 and 1961.

In the early 1950s, the historical centers of Krimulda and Turaida were administratively attached to Sigulda. Three sanatoriums and a tourism facility at Turaida were opened. In 1969, an air cable car was installed across the river valley to improve links to Krimulda. The Gauja National Park at Sigulda turned into a very popular facility, visited by some 1.5 million tourists each year. Between the 1960s and 1980s construction in Sigulda was typical of small town building in the Soviet Union. Private homes sat alongside blocks and blocks of communal housing structures.

After the constructions of a luge and bobsled track in 1986, Sigulda became an internationally important center for those sports.

In 2007, Sigulda celebrated the 800<sup>th</sup> anniversary of the founding of the city. This ancient population of the Gauja valley has led to a huge number of cultural goods, including both archaeological and historic ones.



Memorial of the centuries founding of the city. Sigulda

The idea of a special protection of the Gauja ancient valley had generated already earlier, but, from the 20ties, elaboration of special normative was started and accepted with the purpose of defining borders, territories, and special management of the territory. The List No 1 of forests and parks under protection was accepted by the Council of Ministers of the Latvian Republic in July 18, 1922. Three objects from the Gauja valley were in the list:

Turaida manor in forest along the Gauja River (190 ha),

Park at Krimulda (72 ha),

Banks of the Gauja River (294 ha).





The Forest protection normative passed in 1923 defined nature monuments as forest areas or sites that had to be preserved in natural condition due to their historical meaning, or beauty, or scientific value, or presence of rare tree species. A national park was created in Sigulda in the 30ties in a territory of 375 ha.

The protection activities of the Gauja valley at Sigulda were taken up again after the World War II. In 1957 a part of the Gauja valley from the Brasla River delta (including the valley of its lower reaches) to Murjani bridge across the Gauja River was put under protection. Later the areas around Sigulda gained the name “Nation’s Park” thus emphasising the important meaning of the sites in managing tourism and recreation.

Before the organisation of the present Gauja NP, one more part of the Gauja valley was under protection: from “Cirulisi”(Cesis) to the Līgatne River delta including the valley of the Amata River lower reaches.

Separate very significant natural objects were also under protection – the cliffs Sietiniezis, Liepas Ellite, Vinterala, Erglu (Ergelu) klintis, the caves Dolomitu alas on the banks of the Līgatne River, Libanu - Jaunzemju fresh water lime-stone slope, the cave *Gutmanala*.

Forest legislation of the post-war period defined the protected forest areas, included in the I restriction group: recreational forests (at the present area of the Park – previous Sigulda Nation’s Park – 900 ha); forests along rivers (1 km along both the Gauja River banks); forests along railway (500 m on both sides of the railway); forests along roads (250 m on both sides of big roads) and natural monument forests. It is interesting that in the category of preserved natural monument forests category, areas around famous natural objects were included (for example, the cave *Gutmanala*), as well as overgrown forests over culture historical objects (for example, hillock graveyards at “Priedes”, a country house in Krimulda community).

In all those I group preserved forests a special management was stated aimed mainly at the prohibition or restriction of clear cuttings.

Such activities prepared a good start for the establishing of the Gauja NP.

Regular investigations of the Gauja River valley were undertaken in the 1970s, just prior to and following the establishment of Gauja NP. These investigations included geological and hydrological studies, as well as flora and vegetation inventories.

The next period of intensive investigations coincides with the elaboration of the Nature Protection Plan of Gauja NP. It was compiled in 1998-9 as part of a joint Latvia-Denmark project. For the fauna and flora inventories, emphasis was put on summarizing all published and unpublished data. An inventory of woodland key habitats within State-owned forests was carried out for the first time.



Supplementary studies on breeding-birds, specially protected species and habitats and habitats of European Union importance have also recently been made.

### 3.2.2 Cultural heritage

The cultural heritage of the Gauja valley and its surroundings is astonishing. 221 cultural monuments are located in the territory of Gauja National Park. However, overall, together with objects of historic importance, their number exceeds 540.

A 9<sup>th</sup> century Latgalian lake settlement has been reconstructed on the island of Lake Araisi based on materials obtained during archaeological excavations.

The nineteen ancient hillforts, multiple settlements and cemeteries are indicative of the fact that Gauja valley has been inhabited for a long period. It comprises the highest density of hillforts in Latvia.

In the territory of Gauja, at least 6 medieval castles and 3 towns (Straupe, Cesis and Sigulda) were situated.



Cesis' castle.

In the current territory of the Gauja NP, the famous Liv construction master, Marcis Sarums, was born and lead his activities. He constructed the old manor-house at the Sigulda Manor, the tower of the Cesis St. Johns Church, and other historic buildings.

Paper production started to develop in Ligatne since year 1816. The paper-mill of Ligatne is the oldest paper production unit in Latvia, and along with the old town wooden buildings, it is a historic monument of culture and technology of national importance.

Besides farming and livestock breeding, people also mastered various crafts in the sandy lands of Gauja area. A very old profession which lasts till nowadays is that of bee-keeper.



Beginning at the end of the 18<sup>th</sup> century, in several parishes between Cesis and Valmiera actively operated the famous chair craftsmen - in Briezi, Striki, Lenci and Liepa-. The craftsmen made fantastic chairs with wicker seats of birch-tree and clubrushes.

Just as old is the profession of Gauja raftsman. Initially, the timber was floated with floaters, and later also openly. Timber floating in Gauja was discontinued in the 60es of the last century. In Turaida, men –cooper masters- made hoops for barrels and as spoke masters, they also made spokes for whole families for tourists' needs.

Local peasant women were skilful Vidzeme-style blanket weavers, patterned mitten knitters, as well as linen towel and sheet masters.

In the surroundings of Liepa, where there exit high value Devonian clay layers, brick-kilns and potters were used to work there.

Back in 1909, there were 11 windmills and 25 watermills actively operating in the territory of the present day national park, of which 1 windmill and 3 watermills can still be admired in good conditions.

The windmill is located in Drabesi Manor House, Araisi, and was restored by Gauja National Park administration in 1983. The three watermills are situated in Raiskums (Kalna watermill), Priekuli (Vaive watermill), and Ligatne (Kempji watermill).

### 3.2.3 Social framework

#### *3.2.3.1 Administrative organization*

Gauja NP is included within the borders of 3 administrative districts - Riga, Cesis and Valmiera. Riga District forms 18% (16435,3 ha) of the total, Cesis District - 71% (65322,1 ha) and Valmiera District - 11% (9987,6 ha) of the total Gauja NP territory. The Gauja NP includes in the territory of 17 communities, and 3 towns - Sigulda, Cesis, and Ligatne. The least territory of all communities in the Park is that of Seja community (38,2 ha) and Veselava community (282,8 ha), and none of the communities is completely in the territory of the Gauja NP. Only a part of Cesis and Sigulda (towns) is in the territory of the Gauja NP -the ancient valley of the Gauja River-, though Ligatne (town) is completely in the territory of the Park.

Nr	Name	Ha
1	Seja community	38.2
2	Krimulda community	10207.8
3	Incukalns community	905.7
4	Sigulda community	4195.7
5	Sigulda town	1087.9
	<b>Riga District</b>	<b>16435.3</b>
6	Straupe community	9403.2
7	Stalbe community	2060.4
8	Raiskums community	14259.1
9	Priekuli community	7812.1
10	Liepa community	4816.2
11	Vaive community	4590.3
12	Veselava community	282.8
13	Drabesi community	8171.5
14	More community	2344.4
15	Ligatne community	10505.1
16	Ligatne town	707.4
17	Cesis town	369.6
	<b>Cesis District</b>	<b>65322.1</b>
18	Vaidava community	4819.7
19	Koceni community	4498.4
20	Kauguri community	669.5
	<b>Valmiera District</b>	<b>9987.6</b>
	<b>TOTAL</b>	<b>91745.0</b>

Table 1. Communities, towns and districts in GAUJA NP



It includes an estimated population of some 21,000 inhabitants. More than 40% inhabitants reside in the countryside in the majority of communities. Regarding national structure, it is homogenous all over Gauja NP; that is in 7 communities Latvians stand for more than 90%, and in 9 communities, for more than 80%.

### 3.2.3.2 Structure of land property

The legal owners of the land in the territory of the Gauja NP are the State, communities, physical and legal persons. Private properties compile about 60% of the Gauja NP territory and are managed by about 5000 landowners. As the land reform is still in progress, the amount of landowners keeps growing.

About 15% of all the land properties of physical persons are up to 1 ha, mainly in the garden co-operatives, land of common use in the yards of the blocks of flats, lands of the building sites, etc. About 20% of the properties are 1 - 5 ha. They are mainly around the country farmhouses. Accordingly, 75% of the land properties larger than 5 ha and owned by physical persons, are farms. Their average is only 15 ha.

Size of properties, ha	%
5-10	21
10-20	33
20-30	19
30-40	10
40-50	7
More than 50	10

**Table 2. Size of land properties in Gauja NP**

There are about 50 legal persons - legal land owners in the territory of the Gauja National Park-. The biggest is the State Forest Service, having in use mainly lands of the forest fund. Then come communities and enterprises: agro-firm "Araisi" in Drabesi community, State scientific exploring enterprise "Priekulu selekcijas stacija" and Priekuli agro-technical secondary school in Priekuli community. The joint stock company "Lode" is in Liepa community, the farm "Ratnieki" owned by the University of Latvia, and Ltd "Abele" in Ligatne community, the joint stock company "Latvijas Gaze" and Ltd "Vidzemes putnini" in Krimulda community.

About 70% of the properties include not only agricultural but also forest lands. The average of forests there is about 15 ha. About 60% of landowners do not reside on their lands.

Forest land ownership, ha	%
Less than 5	36
5-10	23
10-20	24
20-30	8
30-40	4
40-50	2
More than 50	3

**Table 3. Size of forest properties in Gauja NP**

### 3.2.3.3 Communications

The accessibility of the NP is high. Significant traffic roads to Estonia and Russia crossed the territory of the present Gauja NP already in ancient times, and even the Gauja River was used for this purpose.

Gauja NP lies only 53 km from Latvian main city, Riga, and is bordered by two international highways: Riga-Veclaicene highway (A2), currently on enlargement by Gauja NP's territory, from the north, and Riga-Valmiera highway (A3), from the south.



Enlargement works on A-2 by the NP.



There are also a number of local roads: Cesis-Limbazi, Sigulda-Saulkrasti, Cesis-Valmiera, Cesis-Smiltene and then – roads with regional significance: Cesis-Raiskums-Straupe, Brasla-Ligatne ferry, Sigulda-Inciems, Sigulda-Vildoga-Ligatne, Sigulda-More, More-Ligatne, Auciems-Janaramis-Sietiniezis-Rubene, etc., and many gravel-paved and smaller community roads.

It can also be accessed by the passenger and freight railway Riga-Sigulda-Cesis-Valmiera, which crosses the whole territory of the NP, as well as by public buses running from Riga-Sigulda-Cesis-Valmiera.

It is possible to cross the Gauja River using bridges at Murjani, Sigulda, Janaramis (weight limit – 15 t), and Valmiera. Pedestrian bridges - in Sigulda near the Devil's cave and at the Janaramis bridge. There is an old ferry at Ligatne. Only buses cannot use it. There is a cable-car in Sigulda where a hanging vehicle can carry 23 passengers between Sigulda and Krimulda.

#### 3.2.4 Economic activities

Any economic activities are based on the possibilities of using specific natural resources of the definite territory, as well as on services.

The present situation shows that the number of people employed in services is growing. Highly productive techniques are used in land and forestland management as a result of the state economical development, what causes unemployment for local inhabitants.

Still, thanks to the natural resources being kept non-transformed to a high degree on the ancient banks of the Gauja valley and its tributary steep-banks, an attractive environment has formed there for the society to rest. They make the recreational resources of the Gauja NP, where preserving and non-exhausting usage gives more and more possibilities for the service management, offering employment possibilities for inhabitants.

Main economic activities in the territory of Gauja NP are: agriculture, forestry and tourism.

The majority of inhabitants deals with the primary sector in the countryside – in farms and in forest management, including wood processing variety-. More than 30 big sawmills are functioning in the territory of the Gauja NP.





There are also a number of industries of regional importance, standing also as major employers.

These industries are Ligatne paper-mill and Lode (Liepa) brick factory (joint-stock company “Lode”), peat factory in Raiskums, and meat and wood-made products factories, in Cesis. There are also a number of industries related to agriculture, such as Priekuli plant-breeding station, agriculture-firm “Araisi”, society “Vidzemes Putnini”, Priekuli agriculture technical secondary school, Janumuiza agriculture school and co-operative share-holders’ union “Abele” in Ligatne.

Employment in services is not negligible, and implies about 10-15% of local population. Schools, administrative centres, hospitals, sanatoriums, ambulances and rehabilitation centres provide work for local inhabitants.

Part of NP’s inhabitants work also in hotels and tourist houses, the majority of them being located in Cesis and Sigulda. There are some also in Priekuli and it is also possible to stay in the rehabilitation centre in Ligatne. There are smaller guesthouses in Krimulda, Raiskums, Ligatne, Vaive, at Lake Ungurs, in Vaidava.

Average unemployment is 3-4%.

#### *3.2.4.1 Use of forest lands*

The existing normative and the market demanding for forest production determine the usage of forestlands. Many other factors determine forests usage, for example, convenient location and infrastructure, attitude of forest managers and the level of their education.



Cut wood in Vaidava.



Main cuttings were not allowed in the Gauja NP since 1973 and until 1990. It caused growing demand for wood. Amount of different other kinds of cutting (like sanitary and selected cuttings) increased. Wood of lower quality was obtained there. The biological value of forests diminished simultaneously.

Starting by 1991, the previous landowners got their properties back. Then the prohibition of main cuttings was changed by prohibition of clear cuttings, but later on clear cuttings were allowed in the neutral zones of the Gauja NP. But, as the estimation of the Gauja NP State forests was not drawn up until September 14<sup>th</sup>, 1999, clear cuttings were not performed in the state owned forests. It caused more intensive using of private lands, buying and selling of it. Contradictions in normative and unclear formulations of prohibited activities cause anxiety in private landowners about possibility of more strict forest use normative being prepared. The intensive forest cutting is caused also by farmers' incapability of earning enough by agricultural activities and also by the great concentration and power of wood-processing enterprises around towns, especially Cesis.

Local inhabitants use more than 70% of the total forests for gathering wild mushrooms and berries and for walks. The forests of the Gauja NP are used for recreation more than elsewhere in Latvia.

In 3,709 ha of the lands in the natural reserve zones of the Gauja NP, forests are not used and the usage is not planned. The forest management in the Gauja NP restricted zones has to be subordinated to the criteria of natural and recreational values. The same thing happens in culture historical zones, whereas in neutral zones non-exhausting forest usage has to be ensured.

#### *3.2.4.2 Use of agricultural land*

Historically, agriculture has always been the main kind of human activities in the territory of the Gauja NP. Agricultural lands are located in the outlying districts of the Park.

The percentage of the agricultural lands in the ancient valley of the Gauja River, the valleys of its tributaries and their surroundings is currently small. Almost half of the total amount of the agricultural lands – 33,619 ha, is being managed. That means that more than 15,000 ha are not used in agriculture.

Crops and plantings, that make 0,08 ha per 1 inhabitant of the Gauja NP, cover 1,700 ha of the total managed agricultural lands. The other managed part of the lands is mainly dedicated to pastures.

Usage of lands in the countryside is not priority now. Large areas, managed for hundreds of years, are overgrowing by shrubs. It causes the diminishing of agricultural lands, the suffering of the landscape mosaic, and the decrease in meadows biodiversity. It causes country people losing their traditional jobs and their motivation for living in the countryside.



State activities for vitalisation of the rural landscape are an urgent need. Agricultural management ensures traditional-life surroundings, increases biological diversity, and raises the quality of the rural landscape, increasing the recreational potential of the environment.

#### *3.2.4.3 Use of superficial water*

The territory of the Gauja NP is rich in superficial water resources and they are intensively used. This has brought to more or less intensive pollution.

The water of the Gauja NP accumulates from areas 9 times larger than the Park itself: accordingly some 8300 square kilometres. Therefore the water quality in the territory of the Park is to a great extent dependent on the pollution sources outside the Park.

Water from the Gauja River flows into the Riga Gulf, further into the Baltic Sea, thus influencing the Sea environmental condition.

Latvia is proceeding towards convergence with Europe. A step further is improving the equipment of water supply and sewage refining, to reach the standards fixed in several EU regulations. At present in Latvia accordingly to regulations 75/440/EEC; 78/659/EEC 76/160/EEC; 80/778/EEC, all the rivers in the Gauja NP longer than 10 km are supposed to be salmon-fish rivers.

There are 36 sewage water refining-sites located in the territory of the Gauja NP. 10 of them clean the water mechanically, while 26 biologically. The power varies from 29 to 10,000 m<sup>3</sup> a day.

The quality of 22 refining-sites is good, but that from the others is not sufficient. Number of inhabitants served by them varies from 17 to 17,139 people.

Only the blocks of flats in towns and villages are depurated. Sewage waters from individual family houses are not yet included in centralised sewage water collection systems, but are often gathered in local sediment-wells or rubbish-pits.

Sewage water from different small enterprises, restaurants, schools and hospitals also is gathered in common refinement systems.

The main source of industrial sewage water is the Paper-mill in Ligatne with its 3,000 m<sup>3</sup> a day. The biggest polluters in the countryside are cattle farms for appropriate, up-to-date manor gathering places, are not built there. The influence of this source of pollution still is not stated.

Gauja River and its tributaries are among the several rivers in the whole Baltic Sea region where natural lamprey and salmon-fish spawning places are maintained. Different artificial obstacles not letting fish pass them up the river to their spawning places are built on several tributaries. Obstacles have been stated in the following small rivers:

1. The Grivinupe River
2. The Strikupe River (a small dam)
3. The Vaive River (David water-mill)
4. The Lencupe River
5. The Raksupe River
6. The Dzirnupite River at Ungurmuiza
7. The Gruba River at Ieriki
8. The Ligatne River (Kempji water-mill)
9. The Ligatne River (Papermill)
10. The Nurmizi River
11. The Brasla River (fish-farm)

There are 2 fish breeding farms in the territory of the Park: one is on the Brasla River, the other, on the Amata River, in places where dams are built for previous hydroelectric stations. At the dam on the Amata River a fish-way is installed, but its location has proved to be unsuccessful, as migrating fish cannot find its entrance.



Amata River

The fish farms can be sources of considerable pollution from food remains and excrements. However, the fish farms seem not to have lessened the biological quality of the Amata River, and the Brasla River waters.

### 3.2.4.4 Underground resources

Such deposits as clay, sand, gravel, peat and underground drinking and medical waters form underground resources in Gauja NP. Several deposits are investigated. Some of them are used in restricted amounts, mainly in places where usage started before the establishing of the Gauja NP. Only 4 deposits have obtained certificates and allowances for excavating, where in 1998, 82,5 thousands m<sup>3</sup> of clay, 35,9 thousand m<sup>3</sup> of sand and gravel, and 3 thousand tons of peat were excavated. Sand and gravel is obtained in small pits either, but there is no data about the amounts, for it is not for production.

Before the establishing of the Park peat was extracted in several mires. Now it is taken out only from one mire – Ungurpurvs-. 684 ha are the total area where the industrial peat extraction is allowed, 490 ha of it is used for this purpose. 1/3 of it is managed by Ltd” Ungursalas”, 2/3 by Ltd” Unguri”. In 6 peat-fields peat is cut and in others milled. The usage of underground waters is intensive in centralised water supply systems and in water supplies for individual houses. There is no precise information about the usage of underground waters.

Medical water is obtained for commercial purposes in the territory of the Gauja NP (Sigulda, Turaida).

There is an underground gas-storage place in the territory of the Gauja NP, where 4000 millions m<sup>3</sup> of gas is stored every year.

Name of mineral deposit	Suitable mineral	Place	Deposit user	Co-ordinated using time from ... till	Obtaining quotas in using time	Amount of obtaining
Liepa II deposit IV deposit	clay	Liepa community	S/N “Lode”	Till 31.12.2017	70.2 ha (kopā), 898 thous m <sup>3</sup> 3176 thous. m <sup>3</sup>	82.5 thous m <sup>3</sup>
The Ungurs bog	peat	Raiskums and Straupe communities	LTD “Ungursalas” LTD “Unguri”	Till 30.04.2018 till 30.04.2018	189 ha, 500 thous. t 330 ha, 390 thous t	3 thous t
Mālnieki	Sand – gravel and sand	Drabeši community	S/N “8.CRB”	Till 01.02.2008	4.6 ha 150 thous m <sup>3</sup>	20.5 thous.m <sup>3</sup>
Ķeipāni	Sand – gravel and sand	Krimulda community	Self government	Till 25.05.2005	7.6 ha 100 thous m <sup>3</sup>	15.4 thous m <sup>3</sup>

**Table 4. Deposit places in Gauja National Park territory, minerals, users, concession period, quotas and extrated amounts.**



### 3.2.4.5 *Animal resources*

The usage of animal resources is mainly related to hunting. Practical use of invertebrates (wine-mollusc) is started during the last years, subjected to a quota.

Hunting in the Park has managing significance for local forests, aimed at the regulation of the amount of mammals and at avoiding the forest damage they cause. Considering the loss to agriculture due to excessive breeding or concentration of herbivores, protection is provided by human regulation of their amount.

Regulations on wild animals quantity control in Gauja NP envisage the possibility of increasing the numbers of animal species characteristic of the region, rare in Latvia and endangered, as well as reintroducing (bringing in and breeding) animals vanished in the region.

According to hunters' figures, the number of the following animals is to be reduced – elks, red deer, wild boars, roes, beavers, foxes, racoon-dogs, American minks and martens.

It is completely forbidden to hunt the following animals: white and brown hares, badgers, squirrels, wood grouse, black cocks, hazel-grouse, partridges, field pigeons, snipes, geese, ducks and other water-fowls. Wolves and lynxes, both rare in the NP, can be hunted under special circumstances (damages caused by them) and under quotas.

It is not allowed to use dogs for hunting in the Park, except for tracing a wounded animal or in beaver hunting. It is neither allowed to organise hunting with beaters in the restricted zones.

The Gauja NP administration co-ordinates the following related activities:

- forming of new hunting districts and changing of their borders,
- reintroduction of animals,
- keeping and breeding animals in fencing,
- hunting with hounds in neutral, restricted landscape and culture historical zones in cases of epizootic, and for diminishing the number of wild bores, foxes and wolves.

Hunting involves mainly local residents of the Park, that is, about 400 hunters joined in 20 collectives, take part in regulating the number of animals. There are also hunters among the Gauja NP staff.

There are some figures about the dynamics of the number and hunting of game animals during 1975 – 1997 in the territory of the Gauja NP.



Year	Number of wild animals					
	Elk		Red Deer		Wild Boar	
	Counted	Hunted	Counted	Hunted	Counted	Hunted
1975.	320	100	3	-	130	50
1990.	140	70	600	240	600	500
1997.	30	-	300	20	300	70

**Table 5. Numbers of main game animals in Gauja NP**

### 3.2.5 Tourism

Its rich cultural heritage, its diverse nature and its convenient location near the capital Riga have made Gauja NP to be one of the most important tourism regions in the country.

The Gauja NP is one of the few places in Latvia where recreation and tourism have already more than a hundred years long history, especially in Sigulda (town).

Sigulda and its vicinity – so called “the Switzerland of Vidzeme”, have always been purposefully subordinated to the development of tourism, since the 2<sup>nd</sup> half of the 19<sup>th</sup> century. The first guide- booklets appeared then and advertised to visit the splendid region.

The local landowner count Kropotkin was the first to see the future of tourism development in Sigulda. He started cottage and boarding house building on the valley slopes and installed so called ‘Alpine paths’ and places for rest.

A strong impetus to tourism was the railway built in 1889 when Sigulda became accessible not only for nearby Riga, but also for the aristocrats of Moscow, Petersburg, and Warsaw. During the Soviet period mass-tourism and low quality standards were characteristic of this territory (up to 1,5 million visitors per year).

Since the territory obtained the status of the national park (1973) the effort to emphasise the educational aspect of the tourism and diminish its influence on the nature has been characteristic.

During the first years after the restoration of independence when the amount of tourists from the previous Soviet Union seriously decreased and Latvian people could not afford to travel due to financial considerations, the amount of visitor in the Gauja NP lessened to some 10 thousands a year.

Tourism in the Gauja NP has revived again during the last years: the amount of visitors is growing, proposals are increasing and services are developing greatly.



Tourists in the NP

New recreational possibilities were created in the Gauja NP territory in Līgatne (Līgatne Nature Trails) and Araiši (Castle and Līv's settlement reconstruction). The improvement of favourite tourism places has continued in Sigulda, around Cēsis, at the cliffs Zvartez iezis, Sietiniezis, Ergļu klintis. The camping places for water tourists at the Gauja River and the Amata River have helped to protect other areas' river banks, as have done auto-tourists camps.

A definite system of pictograms has been elaborated in the Park, maintaining the initial 4 colour (4 seasons) symbolic introduced in 1975 by Osvalds Dinviētišs. The first letters of the Gauja NP are shaped like the winding Gauja River. Constant informational centres and exhibitions are situated in Sigulda and Līgatne.



Figure 2. Gauja NP's logo, as shown in the abundant NP's signs

Main attractions for visitors are the Gauja River itself and its ancient valley, its tributaries, the great amount of geological objects, the majestic scenery, NP's diverse wildlife, and its varied cultural and historical heritage.

Objects relating to the history of civilisation are among the most visited. In some places (Turaida, Cēsis and Araiši) the interpretation of this information has been offered very successfully and is very attractive, what is not typical in Latvia.

Pastoral countryside culture sights are one of the most significant resources of recreation. They are endangered due to unfavourable economical situation for the development of countryside. Architectural heritage has suffered greatly during the Soviet years and the deficiency of investments creates obstacles to using many splendid objects for tourism.

Tourism resources are supplemented with objects arranged during some last 10-20 years, as Ligatne Nature Trails, Sigulda`s bobsleigh route, slalom routs, or adventure and entertainment parks (e.g., Sigulda). Those places are ready to accept a comparatively great amount of visitors and are among the most popular and visited.

The main tourism objects and activities meet the requirements about nature preservation and the recreational policy in the Gauja NP and at the same time are attractive to the majority of visitors, and meet their demands.

Some geological objects possess recreational and scenic significance. Geological objects located in the vicinity of Sigulda, Cesis, and Ligatne educational and recreational park, the vicinity of Liepa, and banks of the Gauja River and the Amata River attach the greatest number of tourists.

The geological objects visited most frequently are: caves Gutmanala, Viktorala, Maza ala, Peterala, Velnala, Kalejala, Stoku ala; cliffs Krauklu aiza, Paradies kalns Velnalas klintis, Vikmestes grava, Raganu katls, Liela ellite, Erglu (Ergelu) klintis, Ilaku iezis. Vizulu iezis, Ainavu krauja, Kaubju iezis, Stuku iezis, Dzilnu iezis, Incenu krauja, Zvartas iezis, Miglas iezis, Lustuzu iezis, Vanagu iezis, Sietiniezis, Kazu iezis, Kuku klintis, Springu iezis, Jumpraviezis, Katrinas iezis, Gudu klintis, Launagiezis, Titmaniezis; boulder Lielais akmens; ravine Kazu grava. Most of the objects are managed according to tourists` demands – sight grounds, stairs, platforms and short description tables are placed there-.



Public use infrastructure at Sietiniezis cliff



Objects located away from the main tourist roads are much less visited, as are those on the banks of the Rauna River, the Raunis River, the Raksupe River, the Ligatne River, the Vaive River and the Brasla River.

Visiting of caves has gained popularity lately. Still it can be dangerous, because caves are formed mainly in sandstone and their cementing is different. Caves with slighter cementing can collapse. Spillage at the entrances of caves appears mainly in spring, during intensive snow melting period, when the previously soaked and frozen sandstone thaws. Up to the present special investigation according to cave safety is not done.

Art monuments of various kinds abound in the territory of the Gauja NP. The most ancient of them are in churches (grave plaques from the 15<sup>th</sup> century), paintings of pulpits (17<sup>th</sup>, 18<sup>th</sup> centuries), altarpieces, stained-glass panels, sconces and candlesticks, silverware etc.), and medieval castles (decorative ornamentation). Wall and ceiling paintings of the 30-50ties of the 18<sup>th</sup> century in Ungurmuiza manor are unique.

Tiled stoves can be found in several manors (Drabesi, Ungurmuiza, Araisī pastor's manor).

A lot of different monuments of art are in Sigulda castle from the 30ties of the 20<sup>th</sup> century, when the Writers' Palace was located there – paintings, stained-glass panels, fire-places, park sculptures and a decorative vase.

There are 6 museums in the territory of the Gauja NP (not including school museums): the Turaida museum-reserve, Araisī lake-castle, the Ungurmuiza museum, "Kalaci", "Leukadijas", and the history and art museums in Cesis.

Interesting objects to see are the paper-mill in Ligatne, the windmill in Araisī, the Kalna, Kempji and Lenci water mill – the 2 last at Ligatne community-.

There are culture-houses and libraries in towns, villages and community centres.

The museums popularise and keep the culture heritage. Festivities of the national (calendar) holidays are celebrated at the Turaida museum-reserve – Meteni, the Easter, the Midsummer (Jani), the Christmas, then the traditional Livi Day, exhibitions, folklore concerts, Rose festivals (dedicated to the Legend of Turaida Rose). The Cesis museum organises Knights' festivals, Medieval feasts, and planers of watercolour painters and garment forges are popular there. It is possible to take part in the 9<sup>th</sup> century feasts in the Araisī Lake-castle.

Studies of applied art and groups of interest also help to keep the traditional heritage in Sigulda, Turaida, Cesis and other places, which unite weavers, basketry masters, potters (ceramics) and other craftsmen, as well as the folklore groups – "Senleja", "Dzieti", "Spurguli", "Dzeinitis", "Ligate", "Senlejina", "Pasacina". Open-air opera festivals are organised in Sigulda with participation of famous artists. Ballet and some opera performances are organised in Cesis.

Activities	Places
Core zone (nature reserve areas)	No tourist activities allowed
Walks, trips	Trails, areas of intensive recreation, most famous nature and culture monuments
Un-motorised water tourism, swimming	The Gauja, The Amata, The Brasla
Pupils' excursions	Areas of intensive recreation, most famous nature and culture historical monuments
Camps in the nature	Camps
Visiting of famous objects of nature	Monuments of nature
Visiting of famous monuments of culture	Monuments of culture
Seeing animals	Ligatne Nature Trails
Cycling	Roads, trails
Orienteering	Most of the NP
Bungee-jumping	Bridge over the Gauja River in Sigulda
Balloon flights	Most of the NP
Cable-car	Sigulda-Krimulda
Adventure and recreation parks	Sigulda

**Table 6. Main tourism activities and places in Gauja NP**

Over 400,000 people a year visit the Gauja NP. Inhabitants of Riga predominate. They are mainly one-day visitors, including pupils' excursions and want to see some popular objects – Sigulda, Turaida, Ligatne, and Cesis-. Both categories mentioned encompass a great number of people with low incomes.

The distribution of tourist flow is geographically irregular. Turaida Museum-Reservation is visited 10 times more than Cesis museum. Only Ligatne Nature Trails and some camps suffer from the extended amount of tourists.

Its seasonal character is also considerable. Pupils come mainly in spring and autumn. Winter counts the least number of visitors and summer, the highest.

Tourism infrastructure has developed lately: new service enterprises are built and the existing are restored. Still the number of places for lodging is insufficient. Questionnaires are the evidence about the development of service. In 1998 in the Gauja NP 975 places in total were offered in hotels. This kind of service differs from 3-star hotels to cheap hostel-rooms and their location is quite regular.

Percentage of occupation is 39,2% - that means 139,5 thousands people a year have stayed in Gauja NP<sup>3</sup>.

In 2008, number of hotels in Sigulda is 7 (441 places) and of hostels, 12 (with over 190 places). Among them, there are 2 hotels and 1 four-stars hostel. There are 12 hotels (607 places) and 35 hostels (with over 934 places) in Cesis and 3 hotels (223 places) and 8 hostels (462 places) in Valmiera.

These figures show that accommodation services have multiplied for 3 in 10 years, from 975 to over 2,857 places, not counting accommodation in country houses, apartments and camping places.

The Gauja NP has arranged and takes care of a certain amount of water and auto -tourist camps, where it is possible to make fire and pitch (set up) tents. The Gauja NP lacks certificated camping-sites, arranged according to international standards, where there are places for caravan, electricity and water available.



Camping place by the Gauja River

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<sup>3</sup> During 1998-9. Data nowadays are supposed to be higher.





Situation about tourist information has improved lately. Tourist information centres in the Gauja NP are in Sigulda, Ligatne, Cesis, and Valmiera.

The Gauja NP has created a vast system of different information signs. It also manages a network of three visitors' centres, in Ligatne, Sigulda, and Zvartez iezis.

Maps of the Gauja NP and Cesis district have been issued; the selection of booklets is extending. Still few of them are widely accessible free of charge or as cheap mass printing material.

Tourism has gained great influence towards the regional economy. According to data from questionnaires more than 500 people are employed in the tourism service in the territory of the Gauja NP and tourism generates incomes of at least 1,486 million Ls a year, that is about 16 Ls/ha<sup>1</sup>.

Although much has been done in creating tourism infrastructure, there exists a lack of common strategy. That has an impact on the quality and diversity of tourism activities within the NP.

### 3.2.6 Land use

Historic settlements and human activities have originated a rich mosaic landscape and have determined current land use in the Park.

The last 400 years are characteristic of essential human impact on some areas of Latvia and the Gauja NP. Forests were felled more quickly along the main rivers - the Daugava and the Gauja. Repeated felling, their regeneration and planting in agricultural lands has caused changing of previous broad-leafed and broad-leafed & spruce forests into coniferous & birch and white alder, as well as spruce and pine forests in Latvia and in the majority of the Gauja NP area. Eventually all the forests in the Gauja NP should be considered to be secondary, that is growing after cutting of the primary forests or on the previous agricultural lands.

Together with the development of agriculture, forests were replaced by man-made biotopes like meadows, pastures and fields in Latvia and in many present areas of Gauja NP.



Current land use distribution in Gauja NP is as follows:

<b>Land use</b>	<b>Covered surface (ha)</b>	<b>Covered surface (%)</b>
Forests	48,592	52,9
Agricultural land	33,619	36,6
Mires	3,776	4,1
Water-covered land	2,563	2,8
Shrubs	978	1,0
Others	2,217	2,4

**Table 7. Land use distribution in Gauja NP**

## 4. Natural values

### 4.1 Introduction

The Gauja NP does not abound in number of rare plants and animal species, but is outstanding for its biodiversity. This is one of the floristically richest regions in Latvia, even though it has not been investigated completely.

About 900 vascular plant species have been found. It stands for 90% of the species located in North Vidzeme geobotanical region.



Thick mixed vegetation covers big areas in the NP

The fauna is not less diverse. More than 200 species of vertebrates - 149 bird and 48 mammal species - reside in the area of the Gauja NP. Such rare birds in Europe as black stork, eagle owl, kingfisher, white-back woodpecker still nest in areas of Gauja NP. The Gauja River is a significant nesting and hibernating place for wild ducks and great mergansers. In non-freezing springs dippers use to hibernate.

As the Gauja River is almost not regulated throughout its whole length, it and its tributaries are among the few rivers in the whole Baltic region where natural spawning places of salmon and lampreys have survived. Besides, the Gauja River is a living place for otters, which have become rare in many European countries. Various sandstone caves and cellars form significant bat wintering places. Out of 2000 country homesteads 100 can be proud for their white stork nests.

Gauja NP includes the primeval valley of the Gauja River and together with its tributaries it forms a particularly original landscape. On the banks of the Gauja, Amata, Brasla, and of many smaller rivers and brooks there are the biggest Devonian outcrops in Latvia – sandstone cliffs, rocks and caves.

Forests cover over 50% of the park's territory.



## 4.2 Climate

The territory of the Gauja NP is under influence from the Baltic Sea. Therefore, maritime climate characteristics are predominant here: expressly cyclonic weather conditions, great precipitation amount and relatively balanced temperature. However, the microclimate varies to a great extent, for example, in river valleys.

The average annual temperature is +5° C. The coldest months are January and February with an average air temperature of -6° C. The warmest month is July, with an average air temperature of +17° C.

The duration of the vegetation period is 180 days. The first snowfall may occur in October, while lasting snow cover is not formed till mid-December, and snow melts at the beginning of April. The thickness of the snow usually is around 15-20 cm.

The annual average precipitation is 705-788 mm, July being the richest in rainfall, and February the poorest.

On average, there are 18 stormy days and 13 snowstorm days annually.

Predominant winds come from the SW.

## 4.3 Geology and Geomorphology

As to the soil classification, 13 soil types have been distinguished.

In the last soil map compiled by K. Brivkalns, 6 different areas of different genetic soil types have been selected out:

- Light Sod-Podzolic soils on medium or light loam on sand and gravel bedrock;
- Medium Sod-Podzolic soils on medium and light loam as well as on sand and gravel bedrock;
- Peaty-Podzolic Glei and Sod Glei soils on medium or light loam bedrock;
- Alluvial soils on sand and gravel bedrock;
- Fen and transitional mire soils;
- Bog soils.

Medium Sod-Podzolic soils and light Sod-Podzolic soils prevail in the Park.

The route of the Gauja River is determined by the unique natural monument –the ancient valley, which was formed by geological processes-

Underneath it, even more ancient and deeper valley is hidden, which serves as the direction sign for rivers, ravines, streams and springs.

The ancient valley of the Gauja River and its tributaries, along with the nearby erosion relief belt, occupy the central part of Gauja NP. The relief forms of the ancient Gauja valley are unique within the whole East Baltic region.

The Gauja River valley is distinguished as a united geographic region. Its development started long before the Quaternary Period, about 1 million years ago. The final formation of the ancient valley occurred during the glacier activity period. The glaciers melted and covered the territory of the Gauja NP anew for several times, the flows of melting waters settled in the terraces of Gauja and brought fieldstones, gravel and clay. The length of the ancient valley has deepened into the bedrock of the Devonian Period. The ancient valley of the Gauja River gained its current look gradually during the last 10,000 – 20,000 years.



The ancient valley crossed by the Gauja River

On the banks of Gauja, Amata, Brasla, as well as of smaller rivers and streams, there are the most significant Devonian era petrology outcrops in Latvia –sandstone precipices, rocks and caves, as well as impressive dolomite outcrops-.

The pink, golden and grey sandstone rocks were formed some 350-370 million years ago. In the outcrops of Gauja sandstones, the visible layers show that during the Devonian era, the territory of Gauja NP was covered by the sea.

Water torrents brought sand, dust and clay rock particles which settled packed and cemented, thus creating the currently visible outcrops of sandstone and dolomite of sedimentary rocks.

On the banks of main rivers, Gauja series sandstones (D3gj) with clay and aleirite layers are mostly visible. For instance, Sietiniezis, Zvartes Rock, Ergli (Ergelu) Rocks, Kuku Rocks, all of them protected natural monuments of national importance.



Above the Gauja series sedimentary rocks, the Upper Devonian Amata series sandstones (D3amt) are layered, which are mainly found on the left bank of River Gauja and on the outcrops of banks of Amata, Rauna, Brasla, and Vejupite rivers. A good such example is Aivanu Cliff, near Karlu fish nursery.

Gauja NP includes over 60 protected geological and geomorphologic natural monuments of national importance –rocks, cliffs and caves-. Two thirds of the caves known in Latvia are located in the territory of the Gauja NP.

The caves on the banks of the Gauja River and its adjoining rivers have formed as a result of suffusion processes. All the suffusion caves have formed in crevices, they are of triangle shape with arch-type, oval entrances.

The most remarkable caves: Gutmanala –the largest cave in the Baltic States-, Kalejala –the longest-, Siguldas Velnala –one of the most popular, and Liela Ellite (the Big Hell) –the most unusual, with arches, cave and a spring-.

#### 4.4 Hydrology

Water basins occupy 2362,2 ha or 2,7% of the Gauja NP area, including lakes and rivers with 1085,8 ha, artificial water-bodies - 145,2 ha-, different ditches - 528,1 ha-.

The most significant water-flow is the Gauja River, the longest river in Latvia. The length reaches 460 km, 1/5 or 93,5 km of which are included in the Park, where it flows through an ancient valley from Valmiera to Murjani.

14 comparatively big rivers fall into the Gauja River each of them with its basin over 25 square kilometres. Hundreds of small river, rivulet and spring waters come together. The total water basin is about 900 square kilometres. Almost all rivers in the Park belong to the Gauja River basin. Only the small Suda River belongs to the Daugava River water basin.

The Gauja River is characteristic for a great number of gravel shoals and islands. The river-bed is formed by loose sand and gravel deposits (alluvia), which drift along the stream. The riverbed is pebbly in some sites; somewhere there are expressive boulder rapids - *Kazu*, *Raiskuma*, *Raksu*, and *Kuku kraces*. The river-bed is 60 – 120m wide with depth being very different (0,3 – 7m). Average flow in a year is about 2,47 cubic kilometres of water, 560,000 tons of alluvia, the last being much more than average in other rivers of Latvia. Water flow has a seasonal character and is very different: in spring – 40%; in summer - only 15%; in autumn - 22% and in winter - 18% from the total year water flow. Daily flow differs from 6 cubic metres in winter to 800 cubic metres during the flood time; average capacity of running water is 69,7 cubic metres; current fall - 234,5 metres, that is 0,5 metres for each kilometre.



The speed of the stream in periods of low water level is 0,2 – 0,4 m/s, in some places – 0,6 – 0,8 m/s, but during flood it is 2 - 3 m/s.



Gauja River forms many meanders and islands along its way

According to the water level differences, the speed of the current peculiarities of the water- flow the Gauja River could be characterised as a very heterogeneous water-flow. The Gauja River usually freezes down in the middle of December, but gets free of ice in the third week of March. During some warm winters the ice cover is only partial. The Gauja River is rich in underground waters, which make the ice thinner in some places in winter and lower the water temperature in summer to a great extent. The water temperature of the Gauja River is lower than in other big rivers in Latvia.

#### 4.5 Landscapes

The landscape is the very first signal about harmony or disharmony in the nature and urban areas. The influence of the landscape is associative, causes emotions, but is always a subjective criterion.

The typical and picturesque landscapes of the Gauja ancient valley, the valleys of the Gauja River tributaries and their vicinity were one of the criteria why the first national park in Latvia was founded just there.

The landscapes of the Gauja NP territory can be divided into following types:

**Landscape of the Gauja ancient valley and the valleys of its tributaries**, where forms of relief – valleys and ravines are characteristic. There are outcrops of the Devon sandstone, meanders of the Gauja River, a net of quick bigger or smaller rivers and rivulets. There are old-rivers in different stages of overgrowing, flood and terrace meadows, mixed forests of broad-leafed trees, including those growing on the slopes of ancient river-banks and scattered, traditional rural buildings.

The landscape of the Gauja ancient valley and its tributary valleys is a unique natural formation of European significance.



Typical Gauja valley landscape

**Forest landscape**, mosaic characteristic, formed by mixed and coniferous forests. Great variety of growing conditions. Structure of growth in different ages; small, mainly closed swamps; mires; forest lakes; and forest clearings without buildings.

Forest landscapes are widespread outside the forests of the Gauja ancient valley.

**Mires landscape**, characteristic of open or partly open moist areas, territories of different size, not managed, rich in various water-bodies, and vegetation typical of wetlands.

Landscapes of mires are located in the largest mires of the Gauja NP as well as in smaller open bogs.

**Landscape around lakes**, characteristic of natural and cultural rural landscapes with scattered buildings located off the lakes' banks.

**Traditional rural landscape characteristic of agricultural lands**. Mosaic of small forests or clusters of shrubs, natural or artificial water-bodies as well as scattered farmsteads surrounded by groups of trees planted around yards. Traditional rural cultural landscapes are widespread all over the Gauja NP territory.

The traditional rural landscape is of secondary significance after the primary – the ancient valley of the Gauja River and its tributary valleys-.

**Landscape of the centres of culture historical buildings**. It appears where the concentration of cultural and historical monuments on a small territory is high. They are ancient castle-moulds, brick-wall or stonewall castles, castle ruins, castle sites, ancient graveyards, churches, manor centres as well as separate farms or crafts-men's houses. The Turaida Museum-Reserve with its restored ensemble of medieval castle and the manor centre is the dominant of the culture historical landscape.

**Urbanised landscape** characteristic of many-storied buildings, centres of service or agricultural management, or similar urban objects.

## 4.6 Main Habitats

### 4.6.1 Forests



Forests occupy 53% of Gauja NP land. Although data regarding forest cover are not summarised, it is thought to have increased in the last hundred years due primarily to the overgrowing of agricultural lands.

The distribution of forests is uneven. The larger areas are situated within the valleys and adjacent areas.

Forests in the Park are very diverse. They belong to 3 vegetation classes. The most widespread are boreal coniferous forests (Vaccinio-Piceetea). The Gauja valley is notable for European broad-leaved forests (Querco-Fagetea), but in some areas Eurosiberian alder woods (Alnetea glutinosae) can be found.

Almost all the forest types distinguished in Latvia can be found there.

In the Gauja River valley, each forest type is characteristic of a certain relief formation. Different types of dry forests occupy the majority (87%) of the forest land. Due to relief peculiarities, there are few wetland forests in Gauja NP. Distribution of forests according to the prevailing tree species is as follows:

<i>Forest type (and dominant species)</i>	<i>Surface cover (%)</i>
Pine forest ( <i>Pinus Sylvestris</i> )	55
Spruce forest ( <i>Picea abies</i> )	17
Birch forest ( <i>Betula pendula</i> )	16
Mixed broad-leaved forests ( <i>Quercus robur</i> )	2

**Table 8. Forest types and their covered surface in Gauja National Park**  
Percentage relates to total forested area in the NP (aprox. 53%).

Gauja NP forests have comparatively different biodiversity from nearby forests because they have a different history of management. The territory of Gauja NP has been densely populated since ancient times and it is reasonable to consider the primeval forests extinct.

Remaining forests are secondary forests, mostly regenerated naturally after cutting or overgrowing of agricultural lands.

Commercial forests management still goes on in private forests and in part of the state-owned ones. At the same time, a lot of comparatively old forest sites exists, where continuity has lasted for many years and features of natural forests have been maintained. The woodland key habitat (WKH) inventory carried out in state-owned forests in 1998-1999 revealed quite a high proportion of these biologically valuable sites.

On average, WKH and potential WKH cover 12% of the surveyed area.

Continuity of forests is longer in ancient valleys and on riverbanks. WKH were encountered mostly in ravines forests, slopes and bank-sides. Therefore, the most widespread types of WKH are coniferous, slope and riparian forests.

Out of 20 WKH types recognized in Latvia, 15 types are identified in Gauja NP.

The inventory of habitats of EU importance and protected in Latvia revealed the presence of 8 such habitat types. Of them, the most characteristic of Gauja NP are the Tilio-Acerion forests on slopes, screes and ravines as well as the natural forests on primary succession stages of landupheaval coasts.

#### 4.6.2 Rivers, streams and springs





The River Gauja constitutes the main water course within Gauja NP. It is also one of the most beautiful rivers in the whole Latvia and the only one that flows entirely within Latvian territory.

Its length is 460 km, of which 1/5 or 93.5 km are in Gauja NP. In this part, the Gauja River flows through a spacious ancient valley which is 1 to 2.5 km wide and whose maximum depth near Sigulda is 85 m.

Gauja River's course in Gauja NP varies from 60 to 120 m wide with rapidly changing depth from 0,3 to 7 m. The torrent decline is 0.5 m/km. Flow speed during low water period is 0.2-0.4 m/s, raising up to 2-3 m/s during the spring water period.

Due to fluctuations of water level, torrent speed and peculiarities of the flow, the Gauja River could be characterised as having a rather variable flow regime.

Gauja River usually freezes over in mid-December and ice starts moving by mid-March. Plenty of underground water flows into the Gauja River; therefore it has lower water temperature than the rest of bigger rivers in Latvia.

Gauja River and the lower stretches and its tributaries are characterised by loose and unstable fine sand stream beds.

The amount of sediments carried out by the River Gauja reaches 500 thousand tonnes per annum with water discharge varying from 6 m<sup>3</sup>/s during winter to 870 m<sup>3</sup>/s during spate conditions. These factors strongly influence distribution and characteristics of aquatic plant and invertebrate communities.

The River Gauja is characterised by patch-like assemblages of plant communities in sheltered stream sections forming narrow belts of emerged plants like *Typhoides arundinacea*, *Glyceria fluitans*, *Butomus umbellatus* and *Equisetum fluviatilis*. Less frequently communities of *Mentha aquatica*, *Sparganium erectum* are recorded. Submerged plant communities are dominated by *Potamogeton pectinatus*, *P. perfoliatus*, *P. natans*, *Elodea Canadensis* and *Batrachium trichophyllum*. These are distributed unevenly forming scarce assemblages.

In total, 14 smaller rivers flow into Gauja River in the territory of the Park, and the confluence basin exceeds 25 km<sup>2</sup>.

Medium-sized streams (the Amata and Brasla Rivers) are characterised by stony river beds, the presence of springs and consequent low water temperatures with plant communities dominated by aquatic mosses *Fontinalis sp.* and red algae (*Hildebrandia rivularis*). Small patches of pondweeds (*Potamogeton alpinus*) are distributed irregularly. The invertebrate community is dominated by oxygen-preferring species.

Small-sized streams and springs have rather high variations in species and habitat diversity. Thus, River Strikupe has the most diverse macrophyte assemblages while River Kumada and River Grube contain several protected areas.

More than 50 habitats are recorded in investigated Gauja NP streams, though more profound studies are needed to assess them in their totality.



### 4.6.3 Lakes



Gauja NP is rich in lakes of postglacial origin, ox-bow lakes and bog lakes –about 50, all in all-

In its territory, there are approximately 90 water reservoirs, including lakes, millponds, river arm lakes and old river lakes.

The largest of them is Unguru (Rustega) Lake, with 393.6 ha, followed by Vaidava Lake -87.2 ha-, and Raiskuma Lake -78.3 ha-

The deepest is Kanepu lake with 18 m. Peksis Lake, lake Araisi, Lazdinu Lake and Mazmuiznieku Lake are also deeper than 10 m.

According to nutrient status, area, origin of lakes and present plant communities and habitats, all lakes are divided into five categories: lakes with rare oligotrophic plant communities, dystrophic and dyseutrophic lakes, small dyseutrophic and eutrophic lakes, large eutrophic lakes and ox-bow lakes.

Standing water habitats listed in Annex 1 of the Habitats Directive, such as natural eutrophic lakes with Magnopotamion or Hydrocharition type vegetation (3150, 3130) and natural dystrophic lakes and ponds (3160) are well represented in Gauja NP.

Several lakes in Gauja NP host significant populations of rare and protected plant species in Latvia, such as *Isoetes lacustris*, *Littorella uniflora*, *Lobelia dortmanna*, *Sparganium angustifolium* and *Sparganium gramineum*.

Rich saucer lakes with sunk aquatic species and floating plant vegetation are particularly valuable and home of aquatic invertebrates as *Hirudo medicinalis*, *Dytiscus latissimus* and *Graphoderus bilineatus*.

Besides their high conservation value, lakes in Gauja NP play a significant recreation role.



#### 4.6.4 Semi-natural grasslands



Man-made biotopes like pastures, meadows and crops often replace forests in Latvia and occupy at present substantial areas in Gauja NP. With agriculture becoming more intensive, there are still traditionally-managed grasslands of biological importance in river valleys and terraces above the flood-plain.

Natural or uncultivated meadows and pastures are the richest in biodiversity agrocenoses. They have remained mainly in the valleys of the Gauja River and its tributaries.

According to Braun-Blanquet classification, 25 plant communities in meadows were described, though the current state of inventoried grasslands is unsatisfactory.

The *Anthoxantho-Agrostietum tenuis* is the most widespread outside river valleys, while the *Filipendula vulgaris-Helictotrichon pratense* and *Poa angustifolia-Veronica spicata* communities are the most common in the Gauja valley and Gauja valleys' tributaries. These last two are also the more diverse and colourful floristically.

Gauja riverside terraces are characterised by xeric sand calcareous grasslands with *Veronica spicata*, *Dianthus deltoides* and *Trifolium montanum*. In Paslavu meadow inhabits a protected insect: *Psophus stridulus*.

Dry calcareous soil of Gaujmala meadow is rich in orchid species, the most common of them being *Filipendula vulgaris*.

Lowland hay meadows and wet meadows are of great importance for biodiversity conservation. The Moliniju meadow at Araisu Lake is the only such type meadow.

The other meadows are characterised by the dominance of *Carex elata*.

The most characteristic animal species are brown hares (*Lepus europaeus*), white storks (*Ciconia ciconia*) and corncrakes (*Crex crex*).



Today, only 25% of all Park's grasslands are still managed. The remaining ones are subjected to farming intensification, overgrowing, both by trees and shrubs, as well as by expansive species, such as *Brachypodium pinnatum*, *Calamagrostis epigeios*, *Aegopodium podagraria* and *Equisetum hyemale*.

#### 4.6.5 Mires and spring mires

There are 9 raised bogs in Gauja NP. However, altogether, more than 90 raised bogs, transition mires and fens are known to exist in Gauja NP's territory.

Species assemblages on spring mires depend on habitat and availability of nutrients. The communities are assigned to the classes *Phragmiti-Magnocaricetea*, *Scheuchzerio-Caricetea nigrae* and *Oxycocco-Sphagnetea*.

The studied spring mires include rare and protected habitats and species in Latvia as well as in Europe.

Most of the spring mires are classified as Fennoscandian mineral-rich springs and spring fens (code 7160, according to the Habitats Directive), which are typical of ravines.

Rare and protected species include *Saxifraga hirculus*, *Malaxis monophyllos*, *Liparis loeselii*, *Pinguicula vulgaris*, *Riccardia incurvata*, *Moerckia hibernica* and *Paludella squarrosa*. In 2004, *Ligularia sibirica* and *Swertia perennis* were found in the Zusi area, close to the border of Gauja NP. *Swertia perennis* had not been found in Latvia for the last 50 years.

These habitats provide important rest places for migrant bean goose (*Anser favalis*) as well as nesting places for common crane (*Grus grus*).

#### 4.6.6 Outcrops of rocks and caves



Exposed dolomites and sandstones, as well as caves, are dwelling places for many fungi, lichen, moss, ferns and animal species. Some of them occur only in these habitats, while the majority are species characteristic of mountain areas.

In total, 6 species of *Cyanobacteria*, 18 species of macroscopic fungi, 13 genera of microscopic fungi, 19 species of algae, lichens, mosses, ferns and flowering plants, and over 100 animal species were found in Gauja NP's caves. These include main NP's most symbolic animal species populations: bats –one of dolomites caves is known to be the second hibernating place for pond bat (*Myotis dasycneme*) in Latvia-, as well as eagle-owl (*Bubo bubo*) and common kingfisher (*Alcedo atthis*), among others.

Of all outcrop types, sandstone has the richest flora. Specially diverse are moss communities that include *Tortula Lingulata* and other protected species, such as *Schistostega pennata*, *Metzgeria furcata*, *Trichocolea tomentella*, *Rhabdoweisia fugax*, *Anastrophyllum minutum* and *Scapania nemorea*. On some sandstone cliffs, *Ledum palustre*, *Vaccinium uliginosum* and *Sphagnum quiquefarium* were found.

Dolomites are subjected to constant erosion processes, so plants rarely establish themselves on such rocks.

#### 4.6.7 Urban ecosystems



Urban ecosystems are parks, squares, graveyards, gardens and plantings with large number of introduced foreign plants.

Plantings in towns are shelters for local animal and plant species. Considerable areas with natural ecosystems are included in Sigulda and Cesis administrative territories.

The diversity of brought in foreign species is high – especially plant species variants in towns and villages-. They concentrate mostly along roads and streets, on the railways, on rubbish dams, weed-lands and building-sites.

Most of these species stay there for a short time, but some of them have spread outside populated areas and become invasive and a threat to local biodiversity.

Peculiar natural values are connected with old country parks and dendrological plantations, including alleys, hedges and separately growing trees. They are not only a necessary part of cultural landscape, but also a significant living place for plant and animal species. Edges are significant migration passages for many animal species, for instance, bats. They act as linear elements in the landscape.

Country parks abound in very old, holed trees of local species. Often they are the only refuges for species residing in such trees (owls, bats, tree fungi), usually connected with old forests.

In addition to natural values of towns` green areas, they often possess architectural and historical values and are of special significance for inhabitants` recreation.

Towns` green areas are usually not managed and, when they are, their management does not meet the demands of maintenance of biological diversity.

## 4.7 Biodiversity

### 4.7.1 Lichens



The first data on Gauja NP's lichens research is found in 19<sup>th</sup> century publications. In the beginning of the 20<sup>th</sup> century, rigorous investigations of sandstone flora, including lichens were carried out.

Analysis of literature and the herbarium stored in the Department of Botany and Ecology at the University of Latvia testifies 240 lichen species found in Gauja NP.

19 of them are Latvian Red listed species (of a total of 34) and 32 are protected (of a total of 56). Among them, there are such rare species as *Bryoria bicolor*, *Cystocoelus ebeneus*, *Dibaes baeomyces*, *Hypogymnia vittata*, *Peltigera venosa*, *Solorina saccata*, *Usnea florida* and *Lepraria lobificans*. This last species was discovered as a new species in Latvia in 2002.



#### 4.7.2 Fungi



Regular investigations on fungal diversity in Gauja NP were carried out since 1991 in different ecosystems: forests, meadows, parks and bogs.

560 species of the Order *Agaricales* have been ascertained. Of them, about 170 are rare in the Park and in Latvia as well. 6 species (*Boletus erythropus*, *Calocybe ionides*, *Rhodotus palmatus*, *Porphyrellus porphyrosporus*, *Suillus flavidus* and *Xerocomus rubellus*) are listed as protected.

Herbarium specimens have been collected and stored in the collection of the Latvian Museum of Natural History.

With regard to Order Polypores<sup>4</sup>, a list of species was compiled just after the first systematic inventories in Gauja NP in the year 2000. According to results of field surveys, examination of several polypore herbariums and data in literature, 82 polypore species have been identified. Of them, 16 species are regarded as rare or very rare. 6 species (*Fistulina hepatica*, *Grifola frondosa*, *Hapalopilus croceus*, *Phellinus nigrolimitatus* and *Polyporus umbellatus*) are listed as protected.

The most species-rich polypore habitats are spruce, mixed spruce and broad-leaved forests.

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<sup>4</sup> Technically speaking, Polypores (*Polyporales*) is a non-accepted synonym of Order *Agaricales* (ITIS, 2008).



### 4.7.3 Mosses



Investigations of mosses in the territory of Gauja NP started in the 19<sup>th</sup> century. More extensive investigations were carried out in the 1920's, mainly on cryptograms on sandstone outcrops. Within the last decades, investigations have been conducted to get broader information of the distribution and diversity of mosses growing in other habitats and on other substrates.

These studies have provided information about a great variety of species, specially in valleys of the River Gauja and its tributaries, and in ravines. High humidity as well as diversity of substratum and favourable natural conditions have contributed to the growth of unique moss flora in this vicinity.

According to literature and herbarium records, 329 moss species in all have been ascertained in Gauja NP (63% of all moss species registered in Latvia): 76 liverworts (Hepaticopsida) and 253 mosses (Musci).

Many of them are rare in Latvia. Gauja NP is the only locality in Latvia where such rare species as *Rhabdoweisia crispate*, *Saelania glaucescens* and *Warnstorfia tundrae* exist.

### 4.7.4 Flora

Vascular plants are the most comprehensively investigated taxonomic group in Gauja NP. The first written references are from the 19<sup>th</sup> century. During 1975-1989, systematic inventories were performed.

These studies compiled 876 species, 67 of them rare or endangered, 1 subspecies and 9 hybrids of 110 families. Some of these species have probably vanished since then: *Lycopodiella inundata*, *Drachcephalum ruyschiana*, *Isöetes echinospora*, *Gentiana pneumonanthe*, *Arctium nemorosum* and *Cypripedium calceolus*.

Several species have, however, been rediscovered during recent years: *Asplenium rutamuraria*, *Polystichum braunii*, *P. acauleatum*, *Saxifraga hirculus* and *Carex davalliana*.

There are also 4 protected plant species of European importance: *Cypripedium parviflorum*, *Liparis loeselii*, *Agrimonia pilosa* and *Pulsatilla vulgaris*.

Main threats to plant diversity in Gauja NP are changes in habitats due to alterations in their management practices, e.g. the decrease in area occupied by mowed meadows. An additional threat is the spread of highly invasive species, e.g. *Heracleum sosnowsky*, within natural habitats.

#### 4.7.5 Fauna



The very first occasional records on *invertebrate fauna* date back to the 19<sup>th</sup> century. The most thorough studies have been carried out in the Priekuli area as well as in the Gauja valley at Sigulda and Cesis. The most complete studies on beetles, dragonflies and some other families of insects have been done in the vicinity of Sigulda, Ligatne and Cesis. During the last 10-15 years, special attention has been paid to beetles and freshwater invertebrates such as mayflies, dragonflies, leeches, chinchis and caddisflies. Main studies on butterflies and moths took place between 1970-1990's, while molluscs inventory was finished in the year 2000.

As a result of these studies, 7,065 invertebrate species (more than 37% of all invertebrate species registered in Latvia, about 19,000), have been recorded so far within the territory of Gauja NP, while the presumable total number is evaluated at 8,500 species.



Butterflies and moths altogether gather 1,579 species in the Park (64,2% of all Latvian Lepidoptera species). 46 freshwater and 62 terrestrial molluscs' species have also been recorded.

Gauja NP territory is a unique area in the Baltic region with regard to populations of invertebrate protected species –there is no other protected area in Latvia with so many registered populations of various protected species-. Out of 273 species found in Latvia and listed in different national and international protection lists, 117 have been recorded in Gauja NP. Of them:

- Latvian Red listed: 86.
- In Annexes of Bern Convention: 18.
- In Annexes of Habitats Directive: 28.
- Specially protected in Latvia: 70.

With regard to *vertebrate fauna*, studies on fishes done in the 1990's account 43 freshwater and diadromous fish species (i.e., almost all fish species found in Latvia), have been recorded in Gauja NP, 11 of which are listed in the Annexes of the Habitats Directive: *Lampetra fluvialis*, *L. planeri*, *Alosa fallax*, *Salmo salar*, *Coregonus lavaretus*, *Aspius aspius*, *Rhodeus sericeus*, *Cobitis taenia*, *Misgurnus fossilis*, *Thymallus thymallus* and *Cottus gobio*.

Data from different sources have registered 8 amphibian and 5 reptile species.

*Bufo bufo*, *Rana lessonae*, *R. temporaria* and *Zootoca vivipara* are common; *Rana arvalis*, *Anguis fragilis*, *Natrix natrix* and *Vipera berus* are unevenly distributed, and *Triturus cristatus* and *Lacerta agilis* are rare; *Bufo viridis* is found only once; the status of *Triturus vulgaris* and *Rana esculenta* is uncertain; the presence of *Bufo calamita* is probable in the southeastern part. The presence of some other rare species (*Bombina bombina*, *Emys orbicularis* and *Coronella austriaca*) is not verified.

Most studies on birds took place on the second half of the 20<sup>th</sup> century, the majority of these starting after the establishment of the Park in 1973.

The first attempt to make a systematic inventory of all breeding birds within the Park was made in 1995-1997 by means of atlasing, but the survey could not be completed due to lack of financial support. A new atlas project was initiated in late 2002, aimed at mapping the distribution of both breeding and wintering birds on the basis of a 5-km grid (58 squares) for two breeding and winter seasons.

Combined with the data of the 1995-7 study, 166 bird species have been recorded in the Park, 160 of those during the breeding season.



Gauja NP is listed as a Natura 2000 site and included in the list of Important Bird Areas. It is regarded as one of the top breeding sites in Latvia for 10 species: black stork, white stork, corncrake, eagle owl, pygmy owl, kingfisher, black woodpecker, middle spotted woodpecker, white-backed woodpecker, three-toed woodpecker and red-breasted flycatcher.

Current mammal's list dates from 1990-95 and includes 52 species -12 of them are bat species-. Most attention has been paid to small mammals. The Gauja valley is one of the most significant areas for bat hibernation (including for rare bat species) in Latvia. Various sandstone and limestone caves, cellars and old big trees host great portion of the bats hibernating in Latvia.

Red deer and beaver have been reintroduced in the NP, while the European mink, once common here, has been replaced by the invasive American mink.

20 of the 31 mammal species on the list of especially protected species are found in Gauja NP, and 10 of those are also listed under the Habitats Directive.



## 5. Legal framework

### 5.1 Aims and purposes

Gauja NP's main aim is to protect untouched nature territories that are characterised by a great diversity in life forms, geological objects, landscapes and cultural monuments.

Other aims of the Park are to promote nature tourism and the sustainable development of the territory it is in.

### 5.2 Zoning

As the territory of the Gauja NP is so varied and includes almost non-transformed nature sites, historically formed rural landscapes as well as important monuments of antiquity, it is necessary to create separate management zones, each possessing its own priority, to ensure adequate protection.

The territory of the Park is divided into five functional zones according to protection and management aims.

<i>Functional zone</i>	<i>Surface (ha)</i>	<i>Surface (%)</i>
Nature reserve	3,668	4
Restricted nature	32,655	35
Landscape protection	40,303	44
Cultural	3,501	4
Neutral	11,618	13

**Table 9. Functional zones in Gauja NP and their absolute and relative cover**

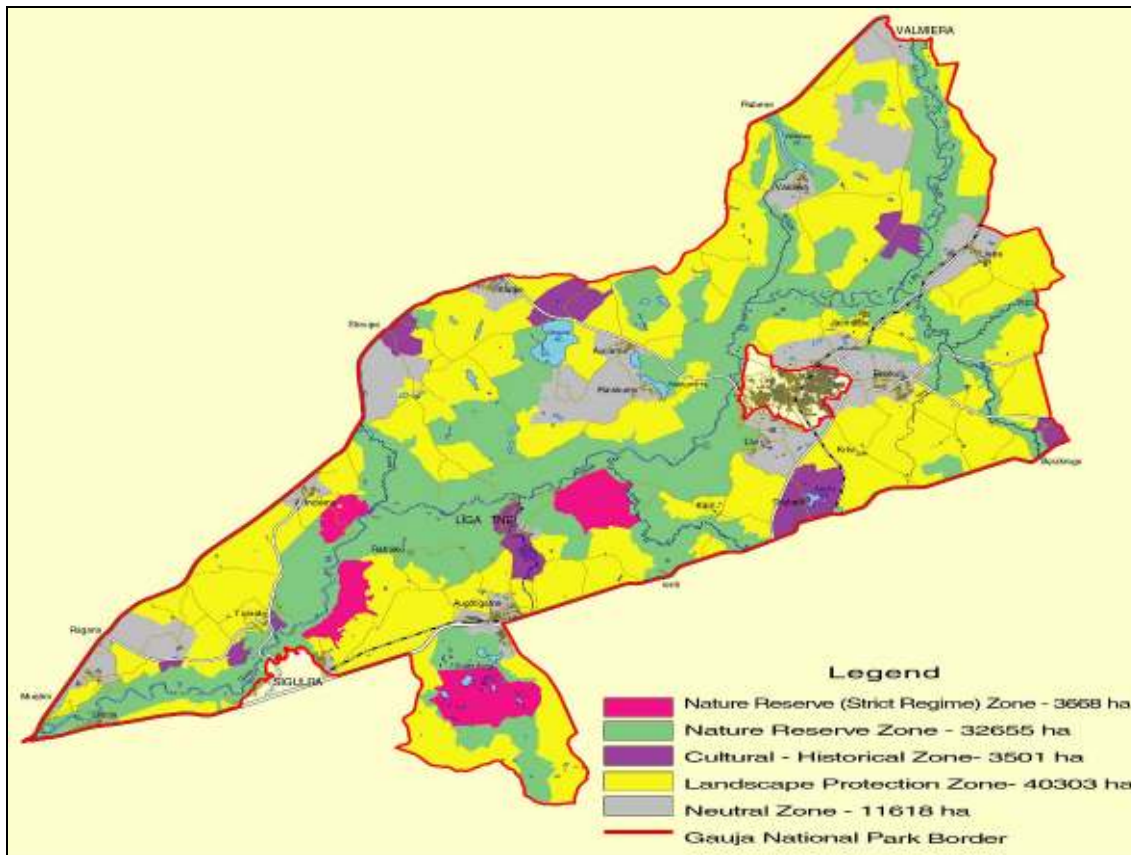


Figure 3. Functional zones of Gauja NP.

The **nature reserve zone's** goal is to maintain natural processes in diverse nature areas as well as nature without any human impact and almost unchanged nature.

To guarantee the wildness of such areas, it is necessary to forbid any use of the natural resources, management and other activities in it, except:

- scientific research;
- fire-prevention activities
- necessary activities for protection and maintenance of nature reserve.

It is allowed to cross the nature reserve only using special routes with the permission of the Park administration, in order to guarantee supervision of activities dealing with scientific research or organised nature cognition trips.

The **restricted nature zone's** goal is to protect nature values of the Gauja ancient valley, valleys of its tributaries and the values of areas located in their vicinity; it protects characteristic nature and culture landscapes, and admits recreation without nature exhaustion.

To guarantee this:

- any obtaining of natural resources has to be realised according to the nature protection plans, submitted to the Gauja NP administration's approval;





- in case of changing of land ownership, the new owner has to sign the agreement about following demands on nature protection with the Park's administration within 2 weeks.

The following activities are prohibited in the restricted nature zone:

- to obtain (get) wood in state and community owned forests, except for cases when cutting is necessary for the protection of biotopes and is done according to the nature protection plans. It is done also in order to increase biodiversity and for lasting reconstruction of artificially made mono-culture stands, as well as in case of primordial (elemental) destruction.
- to obtain wood in clear cuttings;
- to drain of mires and forest lands;
- to spoil, destroy, plough or cultivate the over-flooding, terrace and forest meadows;
- to get of minerals;
- to change the relief or do anything that causes over-ground waters to flow away or erosion processes;
- to use of fertilisers, chemical plant protection substances, other dangerous and poisonous chemicals;
- to burn dry grass and canes as well as remains of forest cutting during the fire-caution period;
- to damage nests, caves and other animal and bird hiding places, pick eggs and other materials of living nature;
- to gather in berries, fruit, nuts, mushrooms and herbs for business;
- to spoil or change elements of aesthetic landscape meaning;
- from March 20 to June 20 to organise mass sport or rest events, not envisaged in the year plans co-ordinated commonly by communities and the Gauja NP;
- to let visitors' dogs go loose without lashes and muzzles;

The following activities have to be co-ordinated with the administration of the Park, if it is intended to implement the following activities in the restricted nature zone:

- any building;
- hydro-technical building;
- transforming of agricultural and forest lands;
- organisation of mass activities;
- business connected with tourism, rest or entertainment;
- setting out advertisements in nature sites;
- trade activities in nature sites;
- entertainment flights.

To ensure undisturbed existence of plants and animals, as well as animal concentration possibilities in the areas, the Gauja NP administration is allowed to announce seasonal restrictions – temporal limiting or prohibiting visitors to remain in exact areas inside restricted nature zone.



The goals of the **protected landscape zone** are to maintain the characteristic landscape diversity and national culture identity. To ensure that, activities essentially changing natural or cultural historically formed landscapes are not allowed.

In case of stating natural values, an inventory of protected areas has to be organised, attributing protection demands of the restricted nature zone.

The goals of the **culture historical zone** are to ensure complex protection of especially valuable culture historical areas, where culture historical monuments are concentrated.

To preserve historical rural buildings – scattered farmhouses-, it is forbidden to divide land properties in parts smaller than 10 ha.

Any building or reconstruction has to be co-ordinated with the Gauja NP administration in those areas.

Before exploring natural or culture historical objects physical and juridical persons have to inform the administration of the Gauja NP.

The goals of the **neutral zone** are to promote sustainable development of densely populated areas.

In case of stating nature values during any inventories or exploring, restricted areas have to be formed there according to protection demands of restricted nature zone.

The area of the *nature reserve zone* encompasses four separate nature reserves: the Nurmizi ravine reserve, the Inciems ancient bank reserve, the Sudas bog reserve and the Roci forest reserve.

The largest zones are the *protected landscape zones*, which comprises 40,303 ha or 44% of the territory of the Park and the *restricted nature zones*, whose total surface is 32,655 ha or 31% of the common territory of the Park.

The most important scenic part of the National Park –the primeval valley of the Gauja River along with its valleys and tributaries- are included in the landscape-protection area.

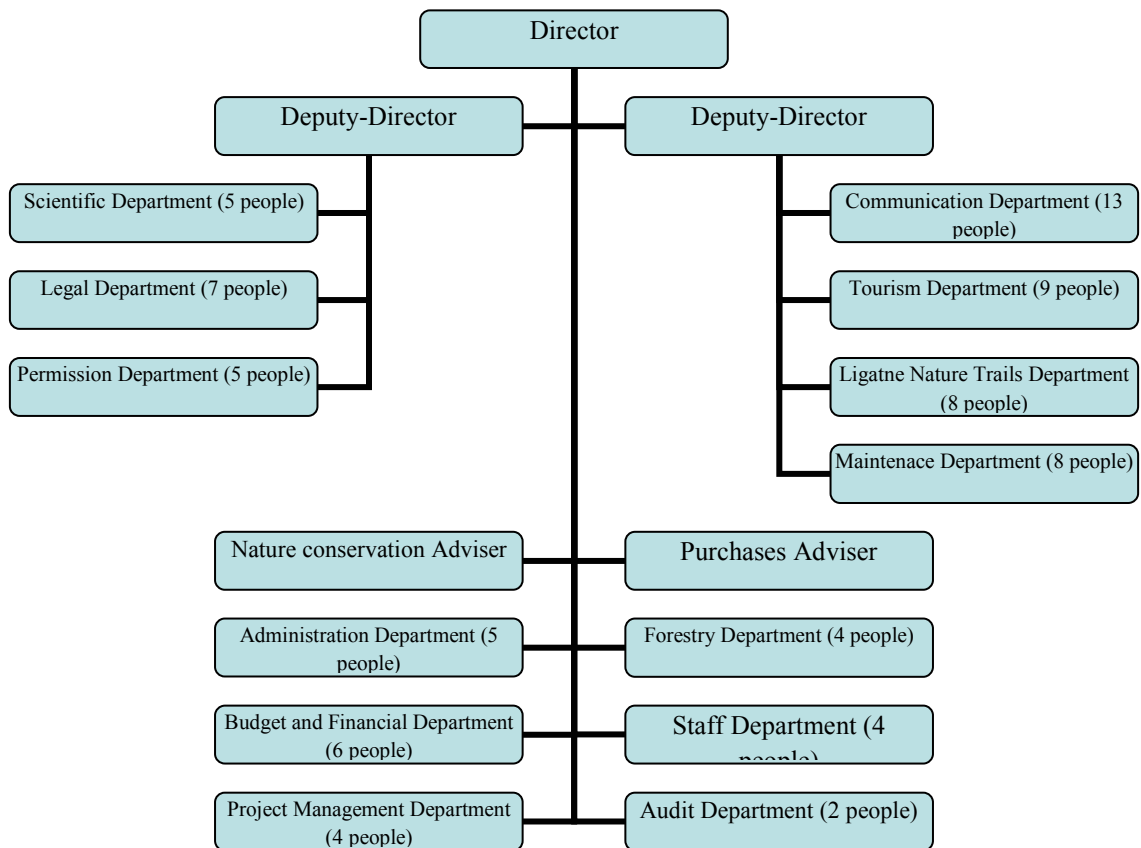
The area of the *culture historical zone* is 3,501 ha or 3% of the Park and it is formed of 9 separately located culture historical areas. They are the church and pastor's house in Krimulda, the manor of Krimulda, the Turaida museum-reserve, Līgatne-Kempji, the museum-park in Araisī, the manor of Veselava, the chair makers' country houses and yards, Ungurmuiza and Straupe.

The *neutral zone* is located around towns and major settlements.

### 5.3 NP's Administration

The management of the Park is implemented by the Gauja National Park Administration. It is a state civil institution supervised by the Ministry of Environment of the Republic of Latvia (ME).

Its organic structure is as follows:



Currently, there are 85 people working at Gauja NP's Administration.

Gauja NP Administration's **main functions** are:

- to supervise and control the territory of the Park according to the Law of the Gauja NP, Gauja National Park Protection and Management Regulations, Nature Protection Plan and other normative acts;
- to provide support for inhabitants and visitors in consideration of legal standards determined in legal acts;
- to accomplish work on public education and research;
- to ensure accomplishment of the inventory needed for nature protection planning and to ensure the elaboration of the nature protection planning;
- to ensure rational and normative acts accordant Park's state property management, ensuring accomplishment of the budget income section;



- to accomplish the Nature Protection Plan foreseen activities;
- to organise sustainable nature tourism development and visitor recreation.

**According to its functions and management plan, Gauja NP's administration has the following long-term management goals<sup>5</sup>:**

-Secure the maintenance and renovation of the nature diversity; lessen the human impact upon natural ecosystems.

-Secure the environment (air, water and land) get not worse but better.

-Preserve and restore cultural monuments and objects, ancient trades and traditions. Support traditional building. Promote the use of historical buildings according to their primary functions. Organise workshops – places for demonstration and training of ancient trades.

-Preserve valuable natural and traditional rural landscapes.

-Secure the maintenance of nature resources and their continuous using, promoting long – lasting regional development.

-Ensure the development of sustainable tourism, creating recreation possibilities and employment for local inhabitants in tourism service enterprises.

-Try to balance the requirements of nature protection with sport activities and resting place organisation managed by local communities.

-Ensure maintenance and systematisation of the information about nature values and resources, cultural heritage, processes in the nature and in urban areas as well as about changes in the environmental policy and normative about the environmental protection in Latvia and the world.

-Promote the co-operation between the Gauja NP administration, local inhabitants, communities and state institutions.

-Ensure the public being informed about the Gauja NP goals as well as of the role of the Park administration and other institutions in reaching them. Add to public knowledge about the nature and culture historical values and their protection.

-Gain international evaluation and recognition of the Gauja NP nature and culture historical values.

-Gain the nature reserves and the restricted nature areas to be managed according to IUCN recommendations for the classification of the II category protected nature areas. The protection of ecosystems in the National Parks is determined by this.

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<sup>5</sup> According to the 1999 Management Plan.



## 5.4 Applying legislation

Latvian national law on protected areas dates from 1993 and is named after: “*On Specially Protected Nature Territories*”. Its general purposes are expressed in Chapter 1, Section 1<sup>6</sup>:

The purpose of this law is:

- 1) to specify the basic principles for a system of specially protected nature territories;
- 2) to specify procedures for the establishment of specially protected nature territories and secure their existence;
- 3) to specify procedures for the administration of specially protected nature territories, for control of the condition of such territories, and for their registration; and
- 4) to combine State, international, regional and private interests in regard to the establishment, preservation, maintenance and protection of specially protected nature territories.

In its Section 4, it develops National Parks, as follows:

### Section 4. National Parks

(1) National parks are broad areas which are characterised by outstanding nature formations of national significance, landscapes and cultural heritage landscapes untouched by human activities or nearly natural, a diversity of biotopes, abundance of cultural and historical monuments, and peculiarities of cultural environment.

(2) The main goals of national parks shall be nature protection, preservation of cultural and historical heritage, scientific research, organisation of education and recreation, which are restricted by the goals of the protection of nature and cultural environment.

(3) The territory of national parks shall be divided into functional zones in conformity with the goals of protection and use. National parks shall have zones in which all natural resources are completely excluded from economic and other activities. In the remaining territory of national parks, only such economic activities are permitted that do not substantially change the structure of historically developed landscapes.

It has been amended repeatedly on the following dates: 30 October 1997; 28 February 2002; 12 December 2002; 20 November 2003; 15 September 2005; and 10 May 2007.

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<sup>6</sup> As it is translated on the Latvian Ministry for Environment’s website.



Other general laws affecting Gauja National Park are:

- On the General Protection and Use of Specially Protected Nature Territories (No 415/ 22.07.2003)
- Criteria for Selecting Sites Eligible for Identification as Sites of Community Importance (*Natura 2000*) in Latvia (Nr. 199/28.05.2002)
- On Protected Geological and Geomorphological Nature Monuments (No 175/ 17.04.2001)
- Order of Making of Agreements to Ensure the Protection of Specially Protected Nature Territories (No 247/ 25.07.2000).

Specific laws on Gauja National Park are:

- a) On Gauja National Park (16-12-1999).
- b) On Individual Protection and Use of the Gauja National Park (No 352/ 07.08.2001).
- c) Statute of the Consultative Council of Gauja National Park (No 239/ 18.07.2000).
- d) Management Plan (Order from 11-10-2004).





## 6. Public Use Assessment

### 6.1 Definitions & abbreviations

#### 6.1.1 Definitions & abbreviations

**Public use** can be defined as the “set of practices and activities derived from the use and enjoyment of protected areas` natural, environmental, aesthetic, landscape or cultural values by the visitors to these areas, individually or collectively, spontaneously or in an organized manner” (Pascual, 2007).

**Tourism** can be defined as the “set of activities developed by people during their journeys and stays in places different than their habitual environment for leisure, business, or other reasons and for a consecutive period of less than one year” (Hernández y Gómez-Limón, 2005).

**Carrying capacity** can be defined as “the maximum amount of people who can visit a concrete place at the same time without causing physical, economic, socio-cultural, or environmental damages, as well as an unacceptable decrease in visitors` satisfaction” (UNEP in Pérez, 1999).

**GNP:** Gauja National Park.

**VC:** Visitor Centre.

**LvL / Ls:** Latvian Lats (national currency).

### 6.2 Generalities

#### 6.2.1 Accessibility

The accessibility of the NP is high. Gauja NP is bordered by two international highways: Riga-Veclaicene highway (A2), currently on enlargement by Gauja NP`s territory, from the north, and Riga-Valmiera highway (A3), from the south.

It can also be accessed by the passenger and freight railway Riga-Sigulda-Cesis-Valmiera, which crosses the whole territory of the NP, as well as by public busses going from Riga-Sigulda-Cesis-Valmiera.

#### 6.2.2 Access type

Access to the NP is free.

There are, however, a number of objects managed by the NP's administration for which visitors have to pay<sup>7</sup>:

- Ligatne Nature Trails (1LvL adult, 0,5 LvL students/pensioners);
- Zvarte Rock (0,6 LvL adults, 0,3 LvL students/pensioners);
- Gauja Ferry by Ligatne;
- Gutmana Cave (parking place);
- Arais windmill;

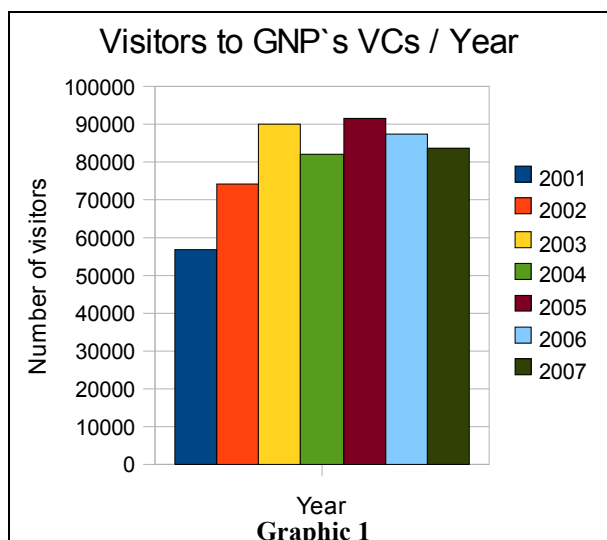
### 6.3 Visitors' characterization

#### 6.3.1 Number of visitors / year.

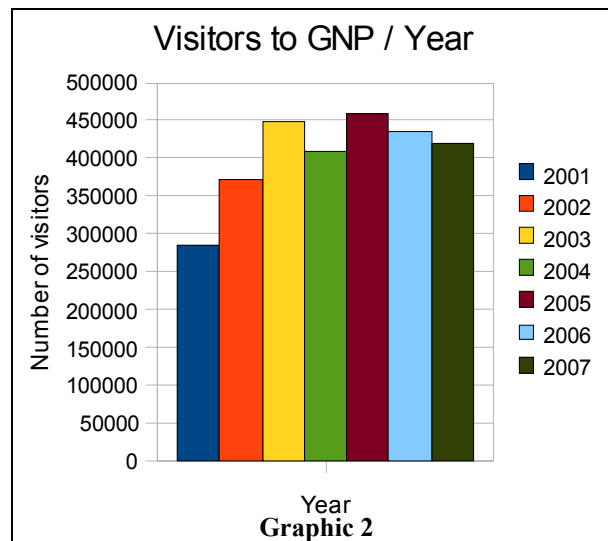
The Total number of visitors to Gauja NP is the result of multiplying the total number of visitors to the 3 visitors centres five times (x 5), as result of estimations of visitor centres attendance in different protected areas (around 20% of the total number of visitors; in Ortega et al., 2006).

VC	2001	2002	2003	2004	2005	2006	2007
Sigulda	6,138	5,240	8,308	9,321	12,902	10,591	6,933
Ligatne	50,738	58,837	67,437	64,004	64,480	61,845	62,276
Zvartes		10,116	13,874	8,726	14,193	14,620	14,494
<i>Total GNP's VCs</i>	<i>56,876</i>	<i>74,193</i>	<i>89,619</i>	<i>82,051</i>	<i>91,575</i>	<i>87,056</i>	<i>83,703</i>
<b>Total GNP</b>	<b>284,380</b>	<b>370,965</b>	<b>448,095</b>	<b>410,255</b>	<b>457,875</b>	<b>435,280</b>	<b>418,515</b>

Table 10. Number of visitors per year



<sup>7</sup> Shown prices according to 2008 tariffs

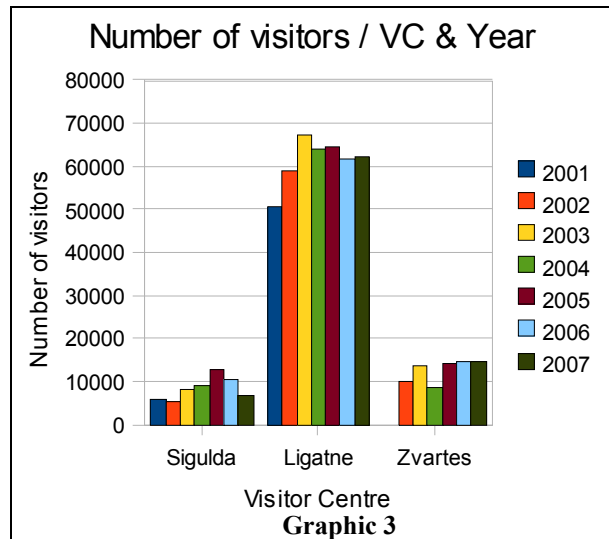


### 6.3.2 Number of visitors / visitor centre and year.

Ligatne's VC is the most visited by far, standing for almost  $\frac{3}{4}$  (74, 4 %) of all visitors to Gauja NP's VCs.

VC	Sigulda	Ligatne	Zvartes	Total GNP's VCs
<b>2001</b>	6,138	50,738	Not opened	56,876
<b>2002</b>	5,240	58,837	10,116	74,193
<b>2003</b>	8,308	67,437	13,874	89,619
<b>2004</b>	9,321	64,004	8,726	82,051
<b>2005</b>	12,902	64,480	14,193	91,575
<b>2006</b>	10,591	61,845	14,620	87,056
<b>2007</b>	6,933	62,276	14,494	83,703
<b>Average</b>	<b>8,490</b>	<b>61,374</b>	<b>12,671</b>	<b>80,725</b>
<b>%</b>	<b>10,3</b>	<b>74,4</b>	<b>15,3</b>	<b>100</b>

Table 11. Number of visitors per visitor centre and year



### 6.3.3 Number of visitors / year & ha.

VC	2001	2002	2003	2004	2005	2006	2007
Visitors/ha.	3,1	4,04	4,88	4,47	4,99	4,74	4,56

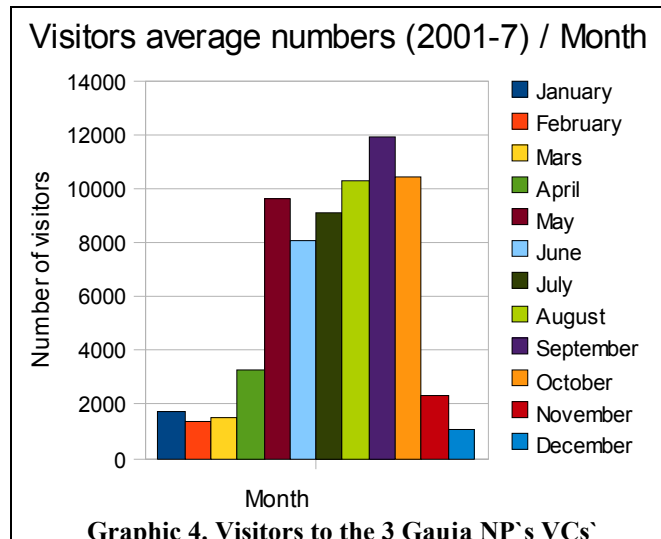
**Table 12. Number of visitors to Gauja NP per year and hectare**

### 6.3.4 Number of visitors / month.

The busiest months are, by order: September, October, August and May.

January	February	Mars	April	May	June	July	August	September	October	Novemb	Decemb
1,738	1,383	1,496	3,268	9,601	8,083	9,073	10,255	11,868	10,459	2,290	1,061

**Table 13. Average number of visitors to Gauja NP per month (2001-7 period)**

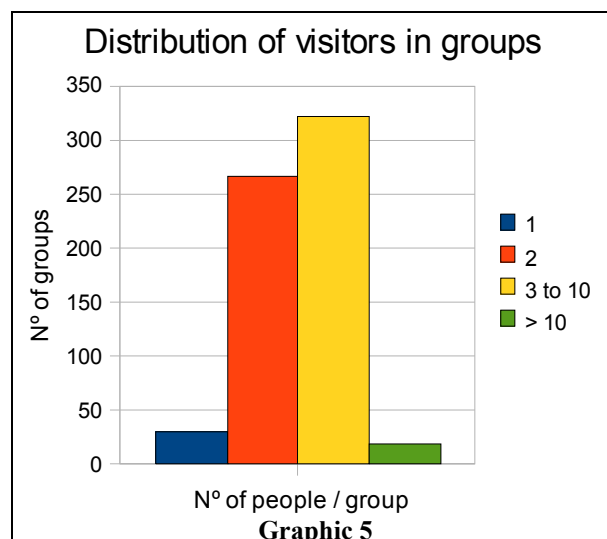


### 6.3.5 Number of visitors / group.

Most visitors to Gauja NP come either in pairs (41, 7%) or in small groups from 3 to 10 people (families or similar, 50, 6%):

N° of people/ group	1	2	3 to 10	> 10
N° of groups	30	265	322	19
%	4,7	41,7	50,6	3

**Table 14. Number of visitors per number of people in each group**





### 6.3.6 Number of visitors' origin countries.

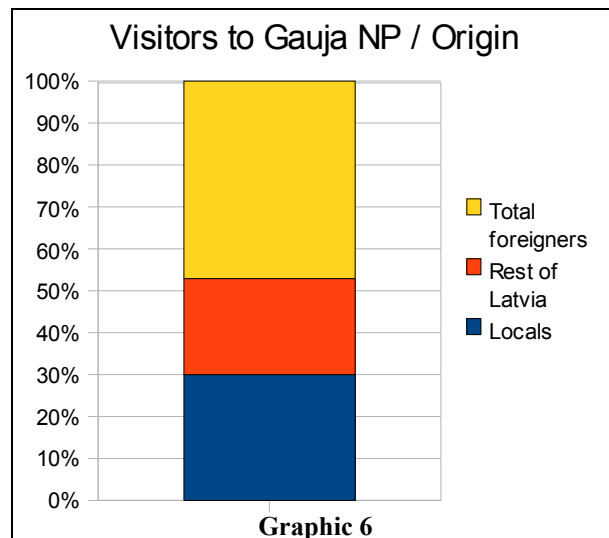
There were visitors from 44 countries (August 2008).

### 6.3.7 Visitors' origin.

Slightly over half of all visitors to Gauja NP are Latvians (53%). Of them, most are locals<sup>8</sup> (57%).

Gauja NP	Locals	Rest of Latvia	Total Latvia	Total foreigners
Figures	708	539	1247	1108
%	30	23	53	47

Table 15. Origin of visitors




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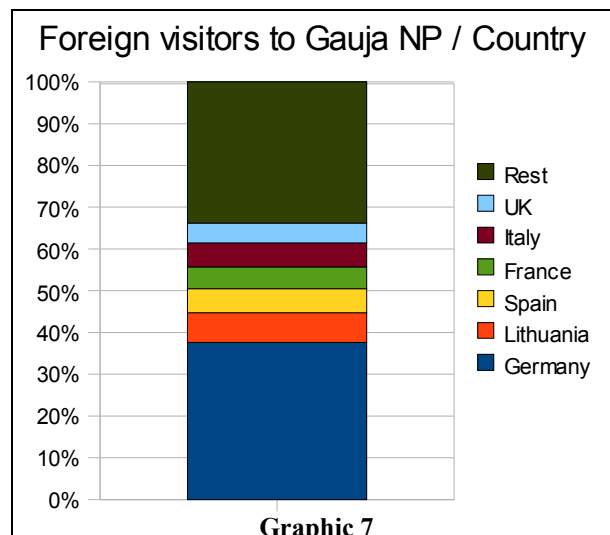
<sup>8</sup> Including visitors from Riga



47% of visitors are foreigners. Out of them, 6 countries stand for over 2/3 (66, 6%) of all tourists to Gauja NP (Germany, Lithuania, Spain, France, Italy and the United Kingdom), being Germany the most numerous by far, with over 1/3 of all foreign visitors to the NP.

Country	Germany	Lithuania	Spain	France	Italy	UK	Rest
Figures	419	76	67	60	59	58	369
%	37,8	6,9	6	5,4	5,3	5,2	33,4

Table 16. Distribution of foreign visitors per country



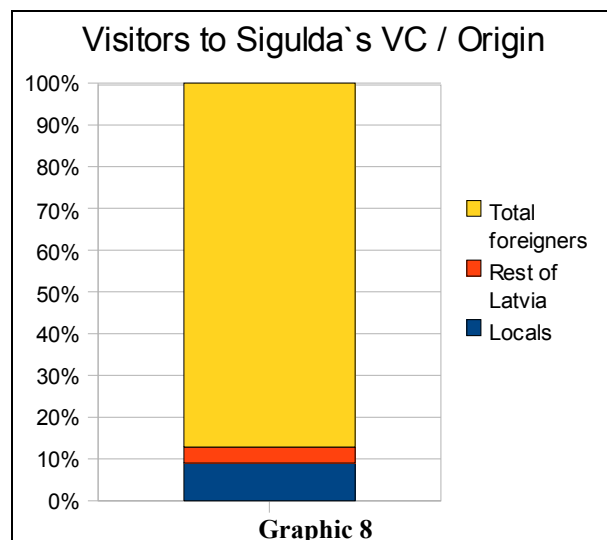


### 6.3.8 Visitors` origin / visitor centre.

In Sigulda`s VC, foreign visitors predominate greatly (87, 2%) over Latvians (12, 8%).

Sigulda`s VC	Locals	Rest of Latvia	Total Latvia	Total foreigners
Figures	70	26	96	656
%	9,3	3,5	12,8	87,2

Table 17. Visitors` origin at Sigulda`s visitors` centre

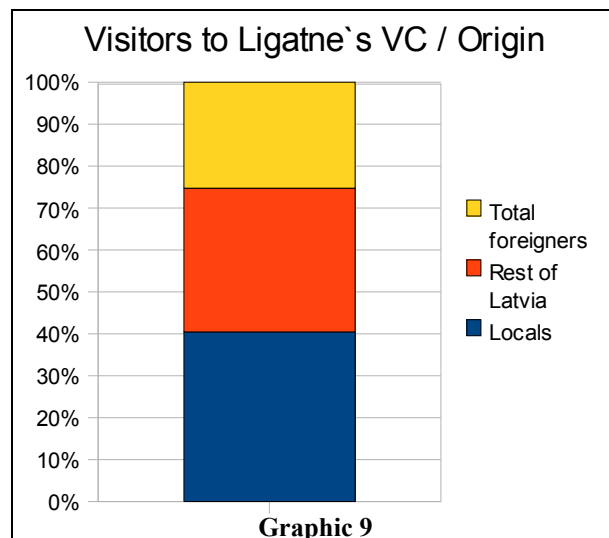




In Ligatne`s VC, Latvian visitors predominate largely (75%) over foreigners (25%).

Ligatne`s VC	Locals	Rest of Latvia	Total Latvia	Total foreigners
Figures	335	286	621	207
%	40,5	34,5	75	25

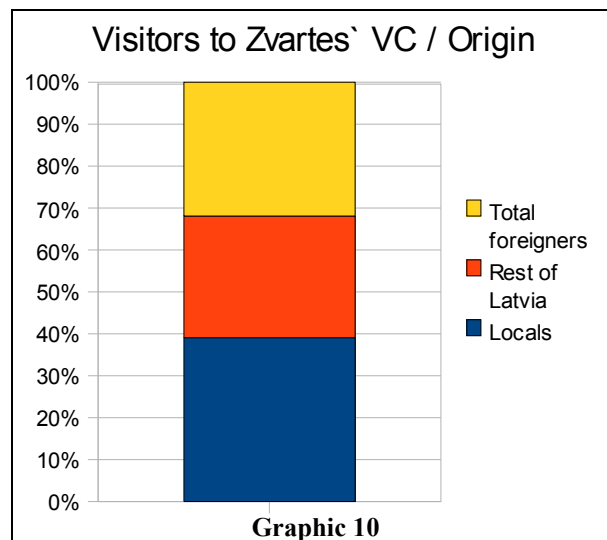
Table 18. Visitors` origin at Ligatne`s visitors` centre



In Zvartes iezis` VC, Latvian visitors predominate clearly (68, 4%) over foreigners (31, 6%).

Zvartes` VC	Locals	Rest of Latvia	Total Latvia	Total foreigners
Figures	303	227	530	245
%	39,1	29,3	68,4	31,6

**Table 19. Visitors` origin at Zvarte`s visitors` centre**

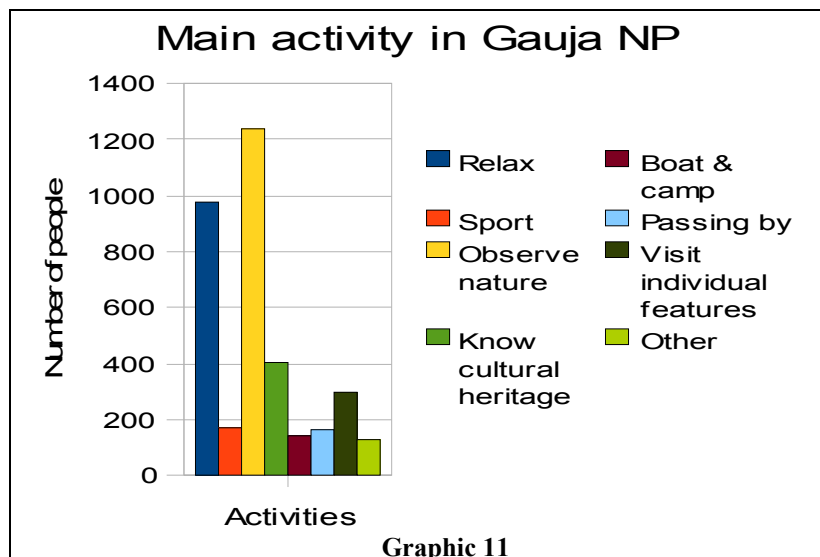


### 6.3.9 Visitors` main activities.

Main activities / motivations of visitors to Gauja NP<sup>9</sup> are: “to observe nature” (35, 1%) and “to relax” (27, 7%) and together, they stand for almost 2/3 (62, 8%) of all activities/motivations of visitors to Gauja NP.

Activity	N° People	%
Observe nature	1,237	35,1
Relax	975	27,7
Know cultural heritage	405	11,5
Visit individual features	299	8,5
Sport	171	4,8
Passing by	165	4,7
Boat & camp	141	4
Other	131	3,7

**Table 20. Main activities / motivations of visitors to Gauja NP**



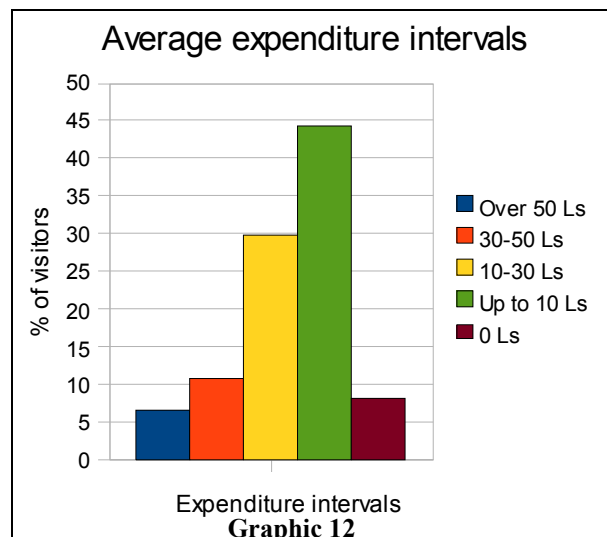
<sup>9</sup> To assess this parameter, multiple choice was allowed. That is why the number of people exceeds the real number of visitors to Gauja NP.

### 6.3.10 Visitors` average expenditure / year.

Average expenditure<sup>10</sup> in August 2008 is:

Gauja NP	Over 50 Ls	30-50 Ls	10-30 Ls	Up to 10 Ls	0 Ls	Total
People	156	255	700	1,039	189	2,339
%	6,7	10,9	29,9	44,4	8,1	100
Average expenditure (Ls)	7,800	10,200	14,000	5,195	0	37,195
Average expenditure (€)	11,700	15,300	21,000	7,793	0	55,793

**Table 21. Average visitors` expenditure in Gauja NP during August 2008**



Average expenditure per person in August 2008 was:

Average expenditure/ person (Ls)	15,9
Average expenditure/ person (€)	23,9

**Table 22. Average expenditure per person in Gauja NP during August 2008**

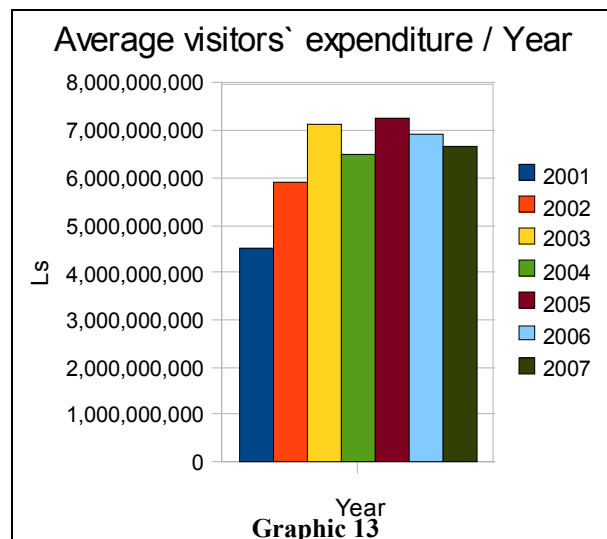
<sup>10</sup> To calculate average expenditure, the average amount of each expenditure interval was selected (i.e., 20 Ls, for 10-30 Ls interval). For the >50 Ls interval, a conservative estimation was done, selecting a 50 Ls average expenditure.



Evolution of total average expenditure in Gauja NP is shown below:

	2001	2002	2003	2004	2005	2006	2007
Total visitors to GNP	284,380	370,965	448,095	410,255	457,875	435,280	418,515
Average expenditure (Ls)	4,521,642,000	5,898,343,500	7,124,710,500	6,523,054,500	7,280,212,500	6,920,952,000	6,654,388,500
Average expenditure (€)	6,796,682,000	8,866,063,500	10,709,470,500	9,805,094,500	10,943,212,500	10,403,192,000	10,002,508,500
Average expenditure/ha (Ls/ha)	49,285	64,291	77,658	71,100	79,353	75,437	72,531

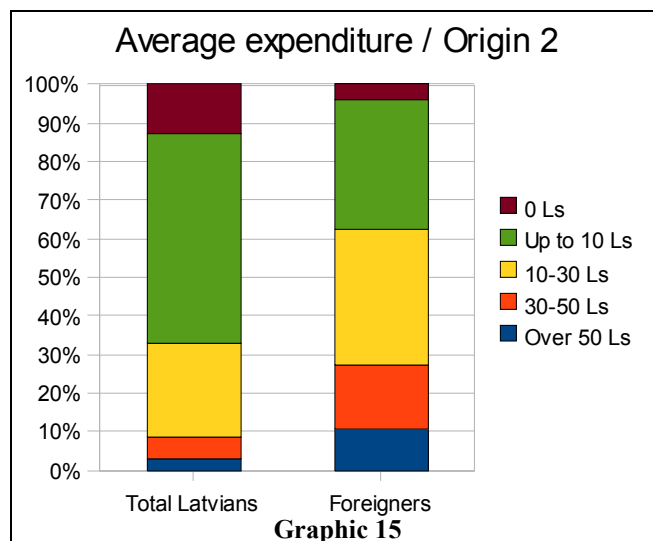
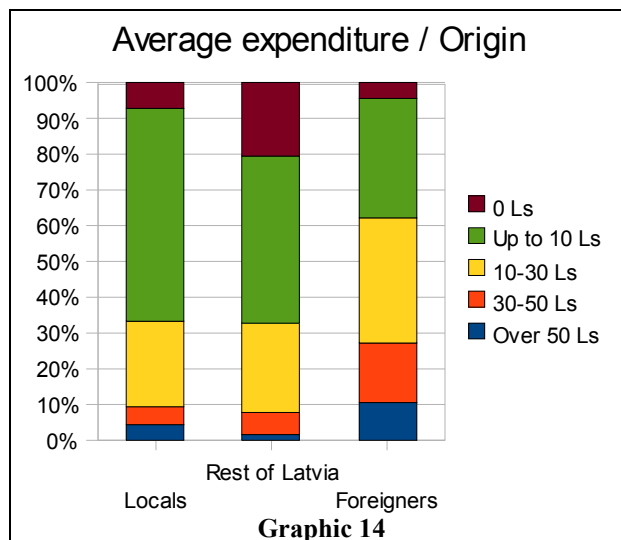
**Table 23. Total average expenditure in Gauja NP per year**



### 6.3.11 Visitors` average expenditure / origin.

	Over 50 Ls	30-50 Ls	10-30 Ls	Up to 10 Ls	0 Ls
Locals	31	36	168	424	49
Rest of Latvia	8	33	138	254	110
Total Latvians	39	69	306	678	159
Foreigners	117	183	386	368	45

**Table 24. Visitors` average expenditure per visitors` origin**  
 Figures show number of people under each category.

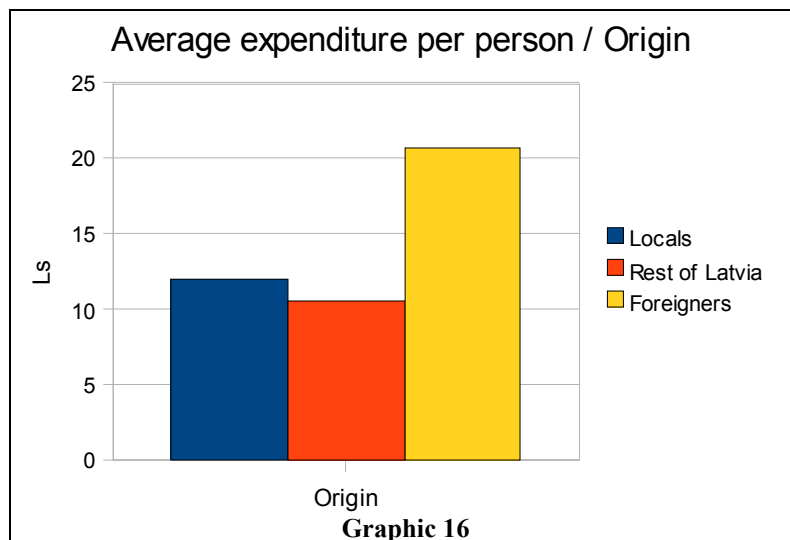


### 6.3.12 Visitors` average expenditure per person / Origin.

Foreigner`s average expenditure almost doubles that of Latvians:

Origin	Locals	Rest of Latvia	Total Latvians	Foreigners
Average expenditure per person (Ls)	11,96	10,59	11,37	20,68

Table 25. Visitors` average expenditure per person, per visitors` origin



### 6.3.13 Visitors` income level.

Income level is considered High, Medium or Low according to the following scale:

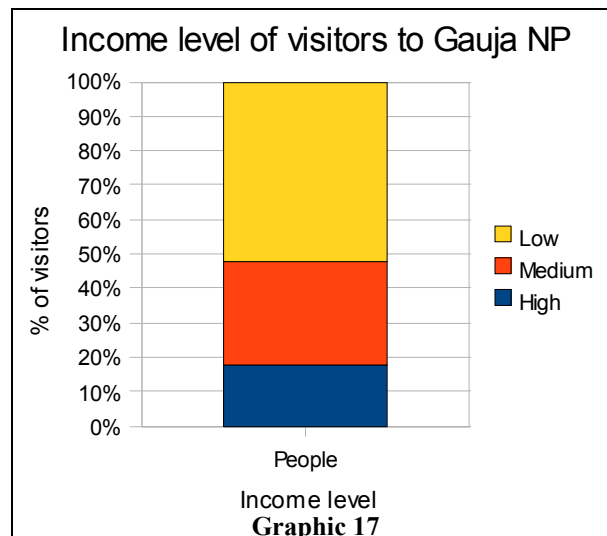
Average expenditure per person in GNP	Nothing	Up to 10 Ls	10-30 Ls	30-50 Ls	Over 50 Ls
Income level	Low	Low	Medium	High	High

**Table 26.** Scale to assess visitors` income level

Thus, income level of visitors to Gauja NP is considered to be *Low* (52, 5 %).

Income level	High	Medium	Low
People	411	700	1228
%	17,6	29,9	52,5

**Table 27.** Income level of visitors to Gauja NP

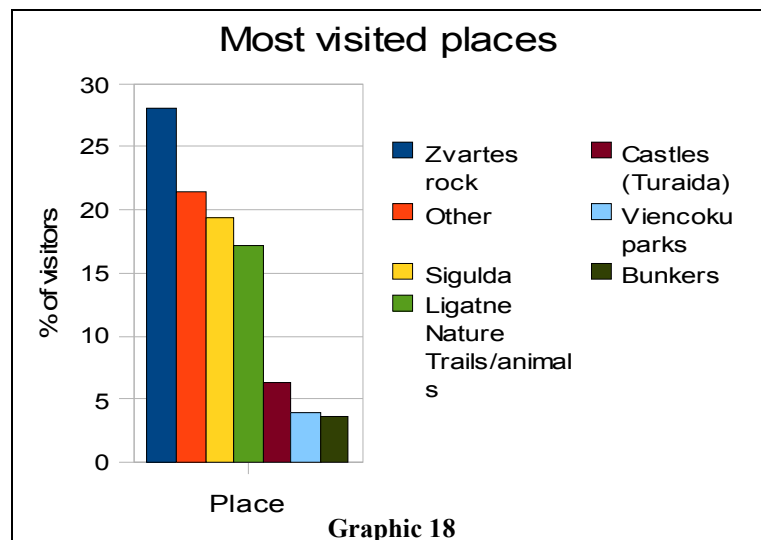


### 6.3.14 Most visited places<sup>11</sup>.

The most visited places in Gauja NP are Zvartes rock (28, 1%), the town of Sigulda (19, 34%), and Līgatne Nature Trails (17, 22%), the three of them standing for almost 2/3 (64, 7%) of all visits to specific places in the NP.

Place	People	%
Zvartes rock	93	28,1
Other	71	21,45
Sigulda	64	19,34
Līgatne Nature Trails/animals	57	17,22
Castles (Turaida)	21	6,34
Viencoku parks	13	3,93
Bunkers	12	3,63

**Table 28. Most visited places in Gauja NP**



<sup>11</sup> Calculated out of the number of visitors who expressed to visit a specific place in Gauja NP as their main motivation/ activity in Gauja NP. Multiple choice answer.



### 6.3.15 Visitors` satisfaction.

Despite the fact that the on-line satisfaction survey was put on the NP`s official website through a banner for one month (11<sup>th</sup> of August till 10<sup>th</sup> of September), and that publicity was also done during the whole August and early September in the 3 NP`s VCs, very few replies (10) were gathered to assess visitors` satisfaction with a degree of representativeness.

Analysis that follows is based on these data and its results should, therefore, be treated cautiously and cannot be considered as representative of visitors to Gauja NP. However, they provide a clue towards where to lead public use management`s efforts.

Visitors seem to be more satisfied about visitors` centres (100% degree of satisfaction) and safety and maintenance of places and infrastructures (90%, both). They show a high degree of general satisfaction with their visit (90%).

The topics they seem to be more dissatisfied with are: accessibility for disabled people (56% of satisfaction), the information they were given (60%) and signing (70%).

Topic	Degree of satisfaction (%)
Visitors` centres	100
Safety	90
Maintenance	90
<b>General satisfaction</b>	<b>90</b>
Parking places	89
Accesses	80
Signing	70
Information given	60
Accessibility for disabled	56

Table 29. Visitors` degree of satisfaction by topic.





## 6.4 Plans, Programmes & Guidelines

### 6.4.1 Annual plan.

There is an annual plan which contains the planned activities to be carried out by the NP's administration that year. It is sent to the Ministry of Environment for approval on the 1<sup>st</sup> of January.

Updates to this plan are made every 3 months and are also sent to the Ministry of Environment for information.

### 6.4.2 Management plan.

There is a management plan approved in 2004. It contains general objectives and recommendations for management. Activities proposed have no specific budget allocated.

### 6.4.3 Public use.

No specific such plan, programme or guidelines exist.

There are just general recommendations in the management plan.

### 6.4.4 Tourism.

No specific such plan, programme or guidelines exist.

However, there exist a study on "Tourism impact on environment; its analysis in Gauja NP's tourist campsites, and methodology to determine such impact".

For many economical activities in the NP, promoters must ask for a permit by the NP's Administration.

### 6.4.5 Environmental education (EE).

There are no plans or programmes.

There are, however, guidelines elaborated by the Ministry of Environment.

There is no specific department devoted to EE, nor specific budget allocated for such activities. However, Gauja NP gets additional funding annually through the Environmental Protection Foundation for these activities.

There have been EE activities planned every year for the last 5 years. For instance, "Bats' Night" has been organized for the last 5 years by the NP staff.

Most EE activities are carried out unevenly, depending on demand and staff and budget availability.

The only permanent EE activities that can be considered as such are "Ligatne Nature Trails" and "Zvartes iezis", the first of them having one specific administrative department with 8 people to manage it. Other EE activities are carried out mainly by staff from this department or from communication department.

It is planned to open two new EE centres shortly, one in Pauguri (Forest School, in Ligatne) and the other on the new NP's visitors' centre, in Sigulda.



#### 6.4.6 Environmental volunteering.

There are no specific plan, programme or guideline to organize volunteering in the NP, though if this is an old activity in the Park with over 30 years' tradition.

There are 4 types of volunteering in the NP:

- a) *Informal*: The oldest one. The volunteer is usually an unskilled person keen on nature conservation. He/she arranges his/her activity directly with the department in need of collaboration. They carry out mainly cleaning and maintenance works. Mainly in spring and autumn.
- b) *European Voluntary Service* (DG Education & Culture, EC): Starting in 2007, an agreement was signed between the NP's administration and the Directorate General for Education and Culture which allows different European volunteers to work between 3 and 12 months, financed by the EC, in different activities related mainly to maintenance and environmental education.
- c) *Working for Nature; Nature for Working*, EUROPARC Federation program: This new program mixes environmental volunteering and internships in European protected areas by young skilled conservationists. GAUJA NP participates since its inception, in 2008, selecting a young conservationist to carry out scientific-technical work for the NP between July and September 2008. This program is funded by the German Environmental Foundation (DBU) in its first year and by the own participant protected areas from then on. They often offer accommodation, meals and/or stipends to young professionals.
- d) *Last year university degree projects*: By science of forestry students. Self-funded.

#### 6.4.7 Information.

There are currently 3 visitors' centres in the NP: Sigulda, Līgatne and Zvartezis. One more is currently under construction at the parking place by Gutmanala cave, which is expected to be finished in September 2008.

There exist information leaflets with generalities about the NP in different languages: Latvian, Russian, English, German and French.

Other more detailed leaflets can be found only in Latvian and English.

There is a NP's website both in Latvian and English at the domain [www.gnp.gov.lv](http://www.gnp.gov.lv)



Figure 4. English version of the Gauja NP's website

#### 6.4.8 Communication.

There is a press secretary who keeps in contact with media and gives information regularly on events, arisen problems and current news.

There exists a communication plan to be sent to the Ministry of Environment every 1<sup>st</sup> of January. It contains a small report of the year planned activities and the responsible persons.

Every 3 months, a small report with more detailed and updated information is also produced and sent to the Ministry of Environment.

A study on “Gauja NP communication with local people” was done by the staff in 2007.

#### 6.4.9 Interpretation.

There exist some guidelines (document by the Nature Protection Board, not yet approved, 2007, second edition) with some specifications about signs, disposition and elaboration of texts, size and colours which protected areas are encouraged to use. It contains also specifications on the design of trails and other infrastructures of public use in Latvian protected areas.

In Annexes 15 and 16 of the current management plan (Latvian version, 2004) there are also some specifications about design of signs.



#### 6.4.10 Participation.

There exist public participation proceedings and bodies (in law).

There is a procedure of public hearings for management plan's approval.

There is also an Advisory Board, with representatives from different organizations, public and private (in regulations, too). It should meet twice a year.

Much effort has been recently done by the NP's Administration to cooperate with local NGOs and municipalities (Meldra Langenfelde's pers. comm.).

#### 6.4.11 Safety.

There are no specific plans, programmes or guidelines. However, safety specifications on tourism infrastructures are included in the guidelines by the Nature Protection Board (2007, not published).

#### 6.4.12 Accessibility (for disabled people).

There exist some national guidelines on accessibility in natural areas. There is also a new website ([www.videspiejamibe.lv](http://www.videspiejamibe.lv)), developed in cooperation with Gauja NP's Administration, that includes information on accessibility.

10 leaflets with recommendations, one of them about recreation in protected areas, (with specifications about buildings, toilets, trails...) were issued in 2002 by the Ministry of Environment in collaboration with an organization of handicapped people (APEIRONS).

## 6.5 Resources

### 6.5.1 Material.

- ~~32 signs~~ and the help of the NP's administration them are hired (on a 3-4 year basis).
- **5 canoes and 3 boats** (one connectable motor too).
- **One tractor.**
- **3 visitors' centres** (one more under construction).
- **21 camping places** for aquatics, tourists and other facilities. There are also 3
- ~~details~~ <sup>12</sup> **public use utilities** provided by the NP's Administration are

Information signs	In total
Information boards	67
Various descriptions	127
Gauja NP maps and schemes	20
Pictograms	522

**Table 30. Public use facilities in Gauja NP in 2008**

Tourism utilities	Sigulda	Līgatne	Ērgļu cliffs	Zvārtes rock	Sietiņezis rock	Camp-sites	In total
tourist trails	75 km	29 km	3 km	2 km	3 km	-	112km
stairs	103	25	2	3	10	1	144
bridges, foot-bridges	922m	313m	30m	68m	66m	6m	1405m
viewing places	28	8	2	3	6		47
resting places	9	6	5	9	3	80	112
toilets	5	5	2	5	2	24	43

**Table 31. Public use facilities in Gauja NP in 2008, continuation**

<sup>12</sup> Figures from 2008

### 6.5.2 Human.

Currently, there are 85 people working at the NP's Administration. Their distribution by management areas is as follows:

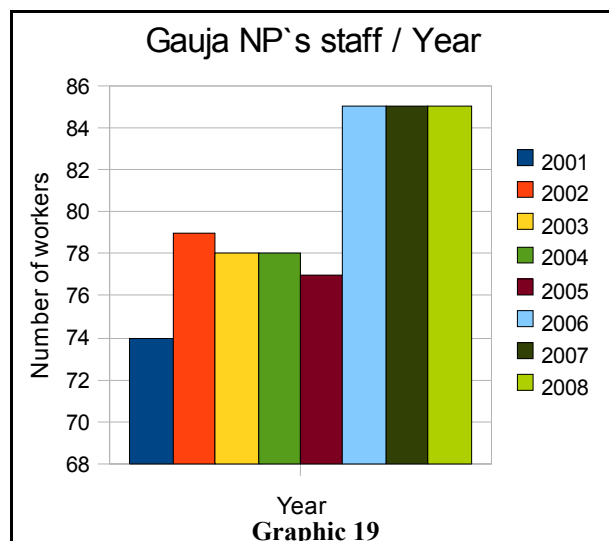
Management area	Staff
Directive	3
Administration	8
Scientific-Technical	11
Public use	22
Surveillance	6
Maintenance	35
<b>Total</b>	<b>85</b>

**Table 32. Distribution of Gauja NP's staff by management area in 2008**

Evolution of staff in Gauja NP is as follows:

Year	GNP's staff
2001	74
2002	79
2003	78
2004	78
2005	77
2006	85
2007	85
2008	85

**Table 33. Figures of Gauja NP's staff per year**



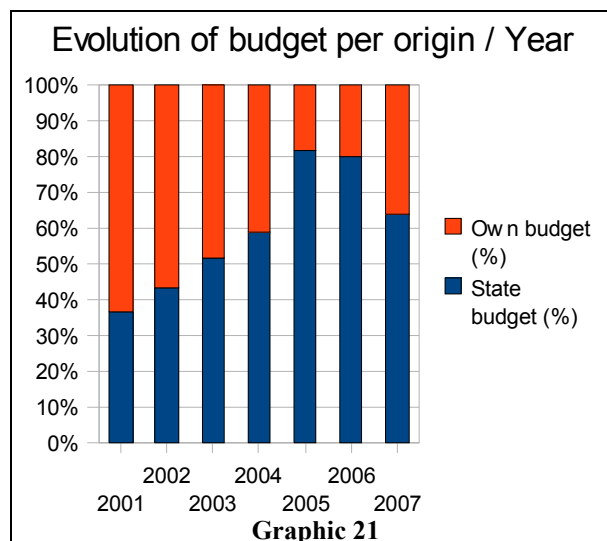
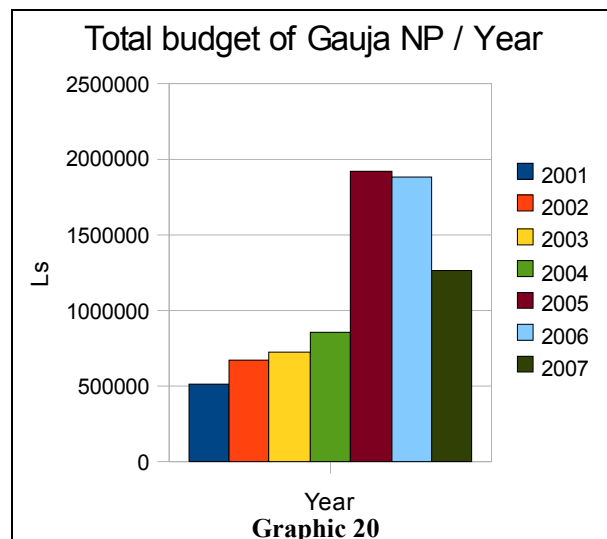


### 6.5.3 Financial.

Total allocated budget (in Ls and €) to the NP for the 2001-7 period is shown below:

Year	Total budget (Ls)	Total budget (€), aprox.	State budget (%)	Own budget (%)	Ls/ha.
2001	515,492	773,238	36,4	63,6	5,62
2002	671,167	1,006,750	43,2	56,8	7,32
2003	720,256	1,080,384	51,2	48,8	7,85
2004	855,746	1,283,619	58,5	41,5	9,33
2005	1,915,759	2,873,638	81,7	18,3	20,88
2006	1,879,402	2,819,103	79,8	20,2	20,49
2007	1,260,569	1,890,853	63,5	36,5	13,74

**Table 34. Total allocated budget to Gauja NP and origin, per year**





The NP obtains its own budget out of wood selling. Amounts got from tickets selling cannot be used by the NP, but go to the general Treasure of the Republic instead. There is no regular private funding of the NP, though some funding is received from private donors (enterprises, foundations, e.g., Gauja NP's Support Foundation) for some specific events.

#### 6.4.4 Research.

No descriptive research is being done at the moment by the NP's administration. There are, however, 3 monitoring programs under development:

- a) White stork's census: annual, from the 80's.
- b) Dormouse: annual, during the summer season, for the last 3 years.
- c) Bats: annual census during hibernation period.

#### 6.4.5 Publications.

Gauja NP does not have its own publishing service, but pays a company for its publications instead.

Scientific publications by the NP's administration in recent years include only: "Biodiversity in Gauja National Park", a compilation of the biodiversity in the NP, 2007 (in references).

### 6.6 SWOT analysis.

Public use is often promoted in protected areas as one of the main objectives of multiple use in these areas within the context of sustainable development. However, from a manager's or conservationist's point of view, public use is not something positive, as it entails a lot of management measures, expenditure and conservation problems. Nevertheless, when appropriately managed and controlled, it can be a compatible activity to conservation measures as well as an important source of incomes.

Its main benefit is fixing population by the benefits obtained from visitors' expenditure, thus valorising NP's resources economically and hampering other types of more aggressive interventions on the territory which could be promoted as a result of the unproductive existence of resources and/or local people's discontent.

Gauja NP has a huge potential for tourism and public use, as we can see out of the "strengths" column.

There are "strengths" related to public use derived from the inner properties of the NP and others that result from good management:



### **Inner Strengths are:**

1. High biodiversity.
2. Rich cultural heritage.
3. Beautiful landscapes.
4. Rich geomorphology.
5. Large territory.
6. Diverse territory.
7. High accessibility.
8. Proximity to Riga.
9. Ancient development of tourism and reputation as tourist place.

### **Strengths due to management are:**

1. Existing protection legislation and management plan.
2. Zoning.
3. Abundant material and human resources.
4. Good environmental quality.
5. Attractive, abundant and well-preserved public use infrastructure.
6. High amenity opportunities.
7. Sustainable land uses.

### **Main Weaknesses related to public use are:**

1. Poor knowledge of English language among the NP's staff.

Very few of the NP's workers –included those attending public at visitors' centres– can speak English fluently or understand it.

Approximately, 2/3 of all foreign visitors to Gauja NP come from Western-European countries, where English is the common language for communication. Even among Eastern-European countries English knowledge is also currently common and is becoming more and more popular, mainly among young generations.

This lack of English knowledge is a serious handicap to relationships with most visitors as well as with foreign specialists or volunteer staff working for the NP and can affect negatively satisfaction of all three groups.

2. Insufficient use of English in signs.

Few signs, out of the thousands existing in the NP are translated into English. Even in most visited places, as Sigulda and its surroundings, many signs are shown only in Latvian, ununderstandable for the vast majority of foreign visitors.

That makes difficult for visitors to properly organise their trip and may result in visitors' losses, confusion and dissatisfaction.



### 3. Insufficient financing.

Between 2006 and 2007, allocated budget to the NP has diminished by almost 33%, in a context of inflation and stable or slightly diminishing number of visitors. Besides, State contribution to the NP's budget has reduced from 79, 8% of the total budget to 63, 5%. This reduction in the State's quota forced the NP's Administration to get extra money out of its own resources –mainly from wood selling-.

Both facts put at risk effective management and conservation of the NP's resources, may entail over cutting and implies insecurity among NP's staff.

### 4. Security in caves has not been assessed.

Despite of speleology being a popular activity in the NP, security in caves has not yet been assessed, thus entailing risk to visitors practicing it.

### 5. Distances to places not usually shown in signs.

There are very few signs in hike and bike trails and paths along the NP where distances to the advertised place are shown, either in length or in estimated time.

This hampers organization of visits for not knowing how long a concrete trail or path will take.

There are few **Opportunities** related to public use from a manager's point of view.

#### 1. Cash in-flow from European funds.

Funds related to rural or regional development, such as EAFRD or ERDF, may increase the amount of available funding to the NP to adequately manage public use and resources' conservation.

#### 2. Research opportunities.

Some aspects of public use, such as carrying capacity of places, security in caves or visitors' behaviour could be studied more in depth by specialists or final year degree students. They could very well complement the present work and help public use managers.



Main **Threats** related to public use are:

1. Mass tourism.

Despite the fact that number of visitors to the NP has remained stable or even slightly diminished in the recent years, the potential damage to biological, cultural and geological resources derived from mass tourism are serious. Additionally, visitors tend to concentrate on the few most popular places leading often to the excess of the carrying capacity of places, thus entailing visitors' dissatisfaction.

2. Enhancement of accessibility.

Accessibility to and inside the NP is currently high. However, works are being carried out to improve it, either enlarging or paving existing roads. Number of visitors to a place is directly determined by its accessibility (Gago *et al*, 2004), so its enhancement may entail risks to conservation of resources and of mass tourism.

3. Inadequate visitor's behaviour.

Though visitors' behaviour to the NP is usually correct and managers care for the protection and maintenance of resources, the potential risk of vandalism or other type of inadequate behaviour –rubbish abandonment, for instance- is not negligible. Effects of vandalism can be easily seen at the most popular geological features, such as on fragile sandstone Gutmanala cave or Sietiniezis' cliff.

Additionally to the deterioration of resources that inadequate behaviour may entail, it leads also to visitors' dissatisfaction.

4. Abandonment of traditional management practices.

The abandonment of traditional management practices in the countryside may impoverish the cultural and biological diversity of the NP, either by the means of uniformization of intensive farming and forestry management practices, or by fields' overgrowing by tress and shrubs, both ways leading to a diminution of the NP's attractiveness to visitors.

5. Water pollution.

Though it is not a big problem currently, it may become so if the number of visitors grows and appropriate water-refining systems are not widely installed in public places, such as camping sites, as well as in houses, hotels, guests' houses and factories.



## 6. Introduction of alien species.

This is a very difficult to tackle threat related to inadequate visitors` behaviour, but a very important one, as the introduction of an alien species may lead to a collapse of the entire ecosystem. This may not have a direct impact on public use, but may be caused by it, as accidental or intentional release of exotic animals –usually pets- in the natural habitats. That is why environmental education explaining why animals should not be released in the wild should be carried out. Perhaps the most cost-effective way of doing so could be by the means of posters at visitors` centres or by information signs in the most popular places.





## 7. Conclusions

- Gauja NP has a huge potential for public use, both as a result of its inner resources and by means of management.
- From a management and conservation point of view, public use is negative, though it is preferable to other more destructive economic activities over the NP's territory.
- Number of visitors to Gauja NP has been over 400,000 a year for the past 5 years, with light variations.
- The most visited visitors' centre is Ligatne's, with almost  $\frac{3}{4}$  of all visitors to the NP.
- The busiest months are September, October and August.
- Slightly over 50% of total visitors to the NP are Latvians (53%), the rest being foreigners. Out of these, over 1/3 of all (37,8%), are Germans.
- There were visitors from 44 countries.
- Main activities done by visitors to the NP are: to observe nature (35, 1%) and to relax (27, 7%).
- Average visitors' expenditure per person on the NP is 15, 9 LvL. Foreigners' expenditure per person almost doubles that of Latvians (20, 7 LvL / 11, 4 LvL).
- Annual total estimated expenditure in Gauja NP in 2007 was 6,654,388,500 LvL.
- Visitors' income level is considered Low.
- Most visited places in the NP are: Zvartes rock (28, 1%), Sigulda town (19, 3%) and Ligatne Nature Trails (17, 2%).
- The topics which visitors seem to be more satisfied with are: visitors' centres (100% degree of satisfaction) and safety and maintenance of places and infrastructures (90%, both). They show a high degree of general satisfaction with their visit (90%).

The topics they seem to be more dissatisfied with are: accessibility for disabled people (56% of satisfaction), the information they were given (60%) and signing (70%). However, data about satisfaction are scarce and results not representative, as a consequence.



- There exist abundant resources devoted to public use. Signing in the NP is ubiquitous and visually attractive.
- A wider use of English language should be promoted both among the NP's staff and on NP's interpretation signs.
- Reduced budget to the NP may hamper the achievement of management objectives, as well as effective conservation and visitor's satisfaction.
- Mass tourism as well as the enhancement of transport infrastructure inside the NP should be avoided. Moreover, little used roads and paths should be closed and restored to their natural conditions, as long as it does not entail damage to local inhabitants. However, adequate maintenance of existing infrastructure should be done in order to provide appropriate life quality to residents.
- An effort to eradicate inadequate visitors' behaviour should be done, be it by environmental education, for instance by specific information on the fragility of features shown on NP's signs, or by appropriate management, surveillance or punitive measures.
- Funding opportunities provided by European development funds should be profited to improve public use management, promote traditional land management practices and to fight against threats such as water pollution or the introduction of foreign species.
- Wider input on public use in the NP by specialists should be promoted.



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## Annex 1

### Questionnaire to visitors to Gauja NP (English version)

Visitor Centre:

Date: \_ / 08 / 08

Surveyor:

1. How many people are you visiting Gauja National Park?.
2. Where do you come from?.

Locals:

(Riga, Cesis & Valmiera regions)

Rest of Latvia:

Foreigner:

(Please, specify country)

3. Why did you choose to visit Gauja National Park?. *Please, tick the ONE main option.*

-To relax:

-To sport:

-To observe nature:

-To know cultural heritage:

-To boat & camp:

-Passing by:

-To visit individual features (please, specify):

-Other (please, specify):

4. On average, how much money (per person) will you spend during your stay in Gauja NP?

- Nothing:

- Up to 10 Ls (15 €):

- From 10-30 Ls (15-45 €):

- From 30-50 Ls (45-75 €):

-More than 50 Ls (>75 €):

You can also **show your satisfaction** with your visit to Gauja National Park by visiting our website: <http://www.gnp.gov.lv/eng/>

All the received responses will help us to enhance visitors' satisfaction with our park and services.

Thanks a lot!!



## Annex 2

### Introduction to the Public Use Assessment 2008

Gauja National Park's administration is assessing public use in the National Park to improve conservation and visitor's satisfaction.

That is why a survey is being carried out in the 3 Park's visitors' centres during the month of August.

To do it adequately, it is extremely important that staff in Visitors centres develop the questionnaire in a reliable and systematic matter.

It is a very simple questionnaire made of 4 questions to be made to every visitor entering the visitors' centre 3 times a week (Instructions will follow) which should not take you more than 30 secs/person to fulfil.

In the name of Gauja National Park and of nature conservation, **Thank You Very Much for your Participation!!**



## Annex 3

### Instructions to surveyors

1. The survey will be done during the month of August, starting the week of 4<sup>th</sup> and ending on the 31<sup>st</sup> (4 complete weeks).
2. The survey will be carried out 3 days a week: on Tuesdays, Fridays and Sundays ONLY.
3. The survey will be done in the 3 current visitors' centres: Sigulda, Ligatne and Zvartes iezis.
4. ONLY 30 questionnaires per day will be delivered. They should be done from the opening hour till they have fulfilled 30 questionnaires to every visitor entering the visitors centre during that time.  
Please, notice that in case of **groups of people** coming together, their replies will be the same for all of them (only one person per group interviewed). E.g. Group of 4 people: -"Where do you come from?". -Germany = 4 people from Germany.
5. With regard to their origin (coming from), 3 specifications will be made: **foreigners** (specifying the country), **Latvians** (except locals), and **locals** (people from Gauja National Park area, including towns and villages partly belonging to the National Park. E.g. Cesis, Straupe).
6. A very brief explanation will be given to visitors if they are reluctant or unwilling to reply: "We are carrying out a research to improve public use and visitor's satisfaction in the National Park. That is why your collaboration is very important. It will take only 20 secs. Thank you very much!".
7. It is very important that all data in the questionnaire are filled in (the 4 questions and surveyor's name).
8. Please, remind visitors to visit the website to show their satisfaction with their visit.
9. Once more, thank you very much for your cooperation.



## Annex 4

### On-line questionnaire on visitors' satisfaction (English version)

By filling in this short questionnaire, you will help Gauja National Park's administration to improve visitors' satisfaction with our Park and services. Please, fill it in providing all relevant information.

1. In general, are you satisfied with your visit to Gauja NP?  Yes  No

Why?

2. Are you satisfied with the main purpose of your visit?  Yes  No

Why?

Which was the main purpose of your visit?

3. Are you satisfied with...accesses to and inside the National Park (roads, railways)?  Yes  No

Why?

....visitors' centres?  Yes  No

Why?

....the information you were given?  Yes  No

Why?

....signs?  Yes  No

Why?

....parking places?  Yes  No

Why?

....accessibility for disabled people?  Yes  No

Why?

....safety of places and infrastructures?  Yes  No

Why?

....maintenance of places and infrastructures?  Yes  No

Why?

Thank you very much!!. We are working to enhance your satisfaction.



## Annex 5

Link to the on-line survey on the official NP's English version website

The screenshot shows the official website of Gauja National Park Administration. The header includes the park's name in large letters and a search bar. The left sidebar contains navigation links such as 'Current events', 'About us', and 'Administration'. The main content area is titled 'Current events' and features three news items: 'September - Gauja National Park anniversary month', 'European Bat Night in Gauja National Park', and 'First visitors in the Ligatne Nature Trails'. The right sidebar lists various services and information, including 'Tourism', 'Events', 'Environmental education', and 'Observations'. A 'Visitor satisfaction survey' button is visible in the bottom left of the main content area.