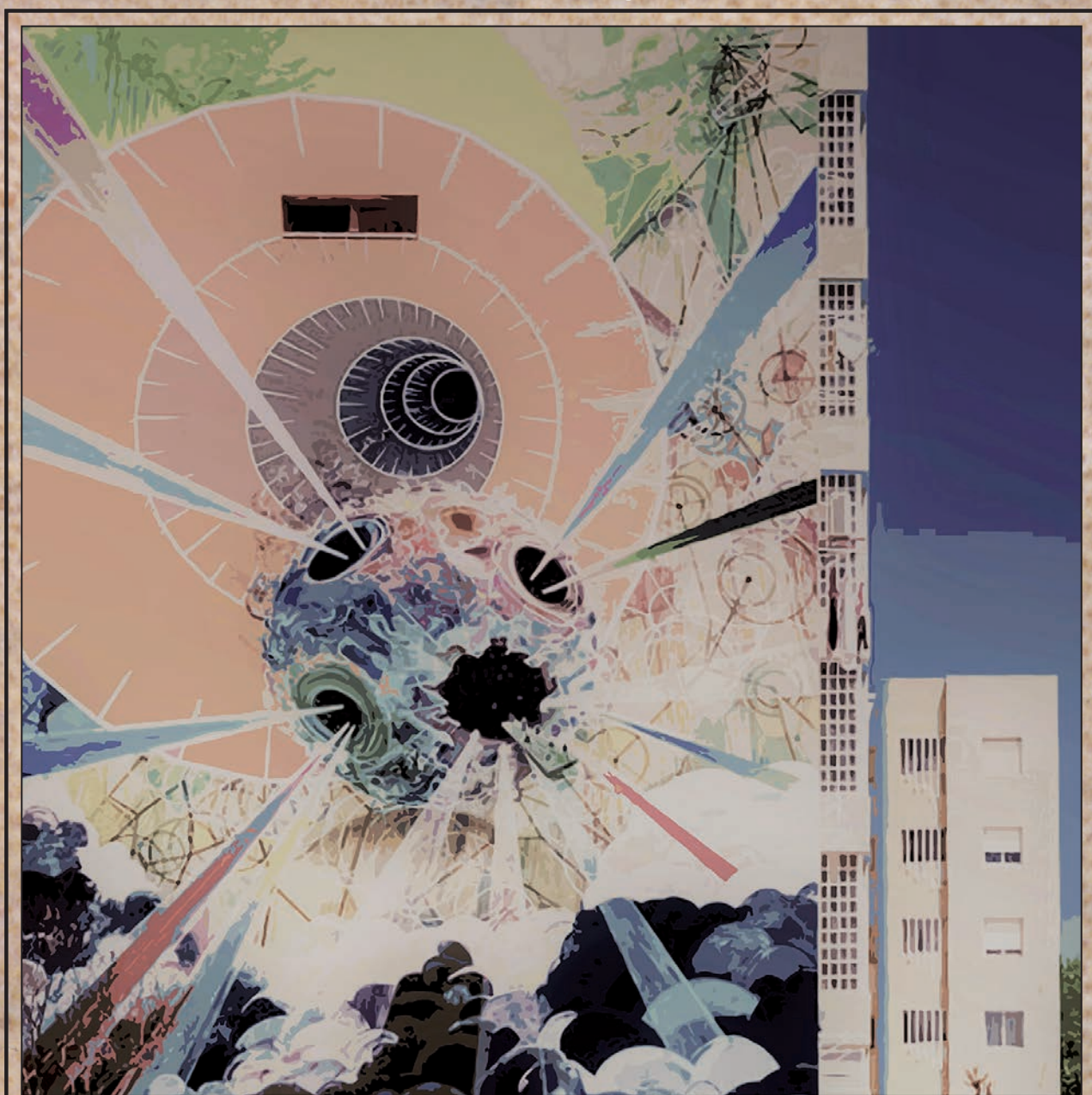


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FORMAL AND INFORMAL NATURAL BATHING SITES AND BEACHES IN THE SLOVENIAN COASTAL ZONE – CHALLENGES IN THE FIELD OF SPATIAL INVENTORY AND PLANNING

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ABSTRACT

The Slovenian coastal zone offers favourable conditions for bathing, which has led to the development of many natural bathing sites and beaches. The article presents the results of the research aimed at recording their legal status, number, extent and capacity. We reviewed official databases, prepared an analysis of the spatial conditions and capacity calculations. The research was based on descriptive and comparative methods and interviews. It was found that there are 17 bathing sites, as recorded in official records, and an additional 29 so-called informal bathing sites located along the entire coastline. The total capacity of all 46 locations is 42,781 bathers. The estimate is almost three times higher than the official data, which addresses the need to upgrade the existing system of spatial recording. Research addresses the analytical approach to assessing conditions in space and contributes to the collection of reliable data.

Keywords: Coastal zone, Natural bathing sites, Beaches, Capacity, Beach Carrying Capacity Assessment, Recording

SITI BALNEARI NATURALI FORMALI/INFORMALI E SPIAGGE NELLA ZONA COSTIERA SLOVENA – SFIDE NEL CAMPO DELL'INVENTARIO E DELLA PIANIFICAZIONE SPAZIALE

SINTESI

La zona costiera slovena offre condizioni favorevoli alla balneazione che hanno portato allo sviluppo di numerose aree di ricezione turistica e spiagge naturali. L'articolo presenta i risultati di una ricerca finalizzata a rilevare la natura giuridica, il numero, l'estensione e la capienza di queste aree. È stata effettuata una revisione dei database ufficiali, un'analisi delle condizioni spaziali e calcoli della capacità. La ricerca è basata su metodi descrittivi, comparativi e interviste. Si è accertato che le zone di balneazione, come censite dai registri ufficiali, sono 17, più 29 zone di balneazione 'informale' dislocate lungo tutto il litorale. La capacità totale di queste 46 aree balneari è di 42.781 bagnanti, la stima è quasi tre volte superiore ai dati ufficiali e risponde alla necessità di aggiornare il sistema esistente di registrazione spaziale. Questo studio, quindi, affronta l'approccio analitico alla valutazione delle condizioni nello spazio e contribuisce alla raccolta di dati affidabili.

Parole chiave: zona costiera, siti naturali di balneazione, valutazione della capacità di carico antropico delle spiagge, registrazione spaziale

INTRODUCTION

The sea coast is an attractive environment for the development of various tourism, sports and recreational activities. Among the primary uses of this space are also natural bathing areas with their functional and scenic features and a strong place-making role. Swimming, sunbathing and leisure time activities in the marine environment have been present since the very beginning of the urbanization of the sea coast. For this purpose, numerous public and private coastal bathing sites or beaches have been established in the area (Cori, 1999; Vaz et al., 2008). Their planning and management, however, present a particular challenge in the context of complex spatial land uses and the development of modern spatial planning acts. Beaches and other bathing areas are, in principle, open public or semi-public spaces that must ensure different conditions regarding accessibility, safety, functionality and infrastructural support (Micallef & Williams, 2002; Rapanta et al., 2021).

In the coastal zone of Slovenia, systematic recording of the spatial conditions, coordination of sectoral interests and consequent spatial planning have become very intensive in the last twenty years. This has been accompanied by increasing investment pressures on the coastal area, procedures in the framework of the preparation of the new generation of spatial planning acts and Slovenia's participation in international projects aimed at the development of maritime spatial planning (MSP, 2014) linked to integrated coastal zone management (ICZM, 2009; Čok et al., 2021). In 2021, Slovenia adopted its first maritime spatial plan (MSP), which defines the uses of space at sea in more detail and also coordinates them with the land-based uses. The plan strongly emphasises the public interest in the sea as a public good, as well as the importance of nature protection in a broader sense. It defines measures to ensure the good condition of the sea and the marine environment (MSP, 2021). The plan is drawn up at a strategic level, defining precisely the administrative sectoral authorities and at the same time transferring the more detailed, executive tasks of spatial planning to the municipalities. These tasks include the planning and management of natural bathing areas, which presents a special challenge to municipalities. In this context, the aspect of ensuring safety against drowning, hygiene standards, support services and traffic accessibility is especially important. All this raises a number of questions concerning the dimensioning of bathing areas, the planning of supporting infrastructure and the award of concessions to appropriate managers. A particular challenge is to produce an assessment of the carrying capacity of the space (for the sea

and the coastal zone), which is now a priority for all maritime countries in the Mediterranean (UNEP-PAP/RAC, 1997; UNEP-WTO, 2005, MSP, 2014).

Even before and during the preparation of the plan, it became clear that there were many data gaps in this field. That was mainly due to the previous practice of partial planning and management of many bathing areas (Čok & Plazar, 2018). However, this observation does not only apply to Slovenia, but also more widely (ADRIPLAN, 2014; PORTODIMARE, 2021). Recording of the spatial conditions showed that bathing and sunbathing activities in the coastal zone are present in various locations and not necessarily only at formally designated bathing areas, where sampling of sea water quality and appropriate safety measures are ensured. The general public has thus, in certain cases, appropriated the coastal space and ensured the exercise of their interest in swimming at will.

Chronology of recent urbanization of the Slovenian coast

The Slovenian coastal area is located in the southwestern part of Slovenia and borders the Republic of Italy and the Republic of Croatia both on the sea and on land. Geographically, it includes the wider coastal strip of Slovenian Istria, which borders the Adriatic Sea to the west. Administratively, it belongs to the Obalno-kraška statistical region and is divided into four coastal municipalities (Ankaran, Koper, Izola, Piran) with a total of 91,600 inhabitants. The length of the Slovenian coast is 46.7 km.

The basic guidelines for the urbanisation of the Slovenian coast are presented in the regional spatial plan by architect Edo Mihevc. In 1963, he outlined the key development activities in the area (settlement, economy, tourism, etc.), both in terms of scale, distribution and interconnection (Kresal, 2016). In the following decades, implementation of this concept was carried out through local municipal spatial plans and implementation projects (Ažman Momirski, 2015). Thus, in addition to the traditional bathing sites in the then existing settlements, alternative locations of natural bathing sites began to develop, following the planned placement of tourism in the area or simply the expansion of settlement areas along the coastal strip. We can say today that the targeted urbanization of the entire Slovenian coast took place relatively quickly. It is also a fact that in the period after independence (1991), interest in the coastal area increased intensively. This was followed by a period of insufficiently coordinated use of the coastal area for the needs of nautical tourism, accommodations, second homes, mariculture and transport infrastructure. This is also evidenced by the fact that coastal municipalities

have been relatively unsuccessful in the past decades in adopting new municipal spatial planning acts mainly because of the administrative or political inability to effectively coordinate interests in the coastal zone (Bucik Ozebek, 2021). The practice of poorly coordinated use of space on the coastal strip has been now at least partially improved by the maritime spatial plan, which imposes new challenges on municipalities within the framework of the authorities and tasks of spatial planning at the local level.

Development and planning of tourism, assessment of the carrying capacity of the area and data reliability

Bathing is one of the coastal tourist activities that can only be carried out in this environment. Tourism, as a desirable economic branch, needs to be provided with the appropriate conditions for its development. However, tourism also has adverse effects (Almeida et al., 2017). In this context, awareness of the need to study the carrying capacity of space and assess the environmental impacts has been present in science and the profession for decades. The initial studies addressed in particular the problem of the concentration of visitors at a particular location and the resulting conflicts. Different studies distinguish between conflicts in the field of supporting infrastructure, conflicts as a result of too little open public space (movement, socializing, sunbathing, swimming) and, of course, conflicts with the protection regimes of the marine environment (CEETO, 2018). In this context, beaches and bathing sites represent special tourist areas with the highest concentration of visitors (Figure 1 & 2).

One of the first more comprehensive studies, with recommendations for spatial planning and tourism planning, is the study *Defining, Measuring and Evaluating Carrying Capacity in European Tourism Destinations* (2001), which, in addition to the various impacts of tourism on space, also highlights the need to define appropriate indicators for the assessment preparation. Also, in a well-known expertise (Klarić et al., 2003), based on several case studies (test areas) of preparation of the assessment of physical carrying capacity (examples from Spain, Italy, Egypt, Albania, Greece, Malta and Croatia), the authors conclude that it is not possible to define a uniform methodology for the preparation of the assessment, since the test cases and the availability of data are very different. Both studies emphasise the need to obtain and use reliable data about space, the environment, visitors, tourist infrastructure, etc. Over the next two decades, a number of Mediterranean countries implemented various international projects aimed at supporting the development of

maritime spatial planning and environmental protection to implement the principles of sustainable development. Great emphasis has been placed on the establishment of appropriate databases and methodologies for planning the activities at sea and onshore (Čok et al., 2021).

Challenges in the planning and management – Beach Carrying Capacity Assessment

In this context, a special place is given to Beach Carrying Capacity Assessment which addresses the assessment of spatial capacity from the points of view of the functional design of the beach (Pereira da Silva, 2002), the physical stability of the terrain and coastal morpho-dynamics (Tejada et al., 2009), and the socio-cultural and psycho-ecological capacity to carry out ecosystem management (Zacarias et al., 2011). It is very important to have reliable data and indicators when making such an assessment (Navarro Jurado et al., 2012). An example of good practice in carrying capacity assessment is a study carried out in the Monte Hermoso area (Huamantín Cisneros et al., 2016). In it, the authors carefully studied the capacities of beaches in the test area. In doing so, they used various tools, such as area calculation, visitor count, video approach, etc. They even defined the movement of visitors in the beach area at different time intervals of the day. The study identified the different determined areas per visitor (e.g. 5 m², 10 m², 25 m²) as the necessary starting point for coastal zone management. In another study (Rodella et al., 2020), the authors use test cases in three Italian regions to examine different parameters and capacities in order to assess the economic value of a particular beach. In this respect, their location (relative to the urban environment and access) and their spatial extent (physical capacity defined by the maximum number of visitors) play an essential role.

All of the above addresses the challenges of data gaps, as countries still face unknowns and rapidly changing spatial conditions when managing coastal areas (including beaches and bathing sites).

For the Slovenian coast, a detailed analysis of the situation in the area of natural bathing sites has not yet been carried out. However, the Regional Strategy for Sustainable Tourism of South Primorska was prepared in 2006, which addresses the listed challenges and also provides specific assessments regarding the current capacities of individual coastal bathing sites. Yet, the data used in this study are limited to sectoral records covering only certain bathing areas. Later, a study on the carrying capacity of Slovenian Istria for tourism (Jurinčič, 2009) was also prepared, which represents a very analytical approach to the treatment of tourism and also in-



Figure 1 & 2: Seaside bathing site – Krka beach – Health Resort, Strunjan: an example of a bathing site with all typical elements (areas for swimming, movement, sunbathing, social contacts, gastronomic infrastructure, etc.) (Photo: Čok, 2023).

cludes the field of bathing areas. The study provides specific capacity estimates, referring to older data sources, but the methodology for calculating the extent of individual beaches or bathing areas is not specified in the study. The study of tourist migrations on the Slovenian coast and the importance of the distribution of attractive elements in the coastal strip was also carried out by Andrade Sierra (2022). Unfortunately, her study is limited to the test area and does not cover the entire coastal zone. This study also highlights the lack of up-to-date spatial data and the limitations of official records.

MATERIAL AND METHODS

Problem Definition and Research Questions

As outlined above, the planning and management of natural bathing sites presents various challenges. From the point of view of the municipal strategic spatial planning acts, their locations must be justified by the objectives of spatial development and appropriately placed in the space. At the implementation level, first the appropriate land use must be ensured and the project documentation prepared only later. The third challenge is finding a suitable manager (concessionaire) to ensure the operation and management of the bathing site. On the Slovenian coast, there is a relatively large number of natural bathing sites, as the primary activity in the coastal strip is tourism, and the physical space allows bathing and sunbathing activities to a large extent. A special challenge is the seasonal appearance of visitors, who quickly overload the transport network in a wider area and occupy large parking areas. The consequences of seasonal peaks are also reflected in the ever-increasing conflict between residents and external visitors (Cigale, 2012), and in locations not primarily intended for bathing that have been usurped by local and external bathers. In this respect, stakeholders in the process of spatial planning are primarily faced with the problem of the uncertain status of individual bathing sites, or those sites that in a formal sense are not at all intended for bathing. To understand the situation in the area and to take decisions on future supervision in the area, it is first necessary to have reliable data on the number, location, capacity and status of individual natural bathing areas. This is the task of the local communities, i.e. the responsibility for detailed planning in the coastal zone as determined by the plan (MSP, 2021). In this context, the following research questions are relevant:

What types of bathing sites exist on the Slovenian coast and who keeps records of their condition?
What is their number, spatial extent and capacity?

Methodology

The research focused on the study of natural bathing sites, more specifically their legal status, terminology, number, spatial extent and capacity. It was carried out in three phases.¹

In the **first phase**, the features of the bathing sites, according to their legal status, were identified. The first step covered a review of the legislation on water and coastal land (Water Act, 2020; Spatial Planning Act, 2021), using the descriptive method and guided by those provisions which classify the typology of natural and other bathing sites. In the second step, an analysis of the municipal spatial planning acts, databases and other documents dealing with natural bathing sites in the area of all four coastal municipalities (Ankaran, Koper, Izola, Piran) was carried out. The focus was on defining the concepts of legal status and the terminological designation of all types of bathing sites.

In the **second phase**, the spatial conditions were recorded. The starting point were the current spatial planning acts of the municipalities, the MSP and the databases of the Slovenian Environment Agency (ARSO). The data were upgraded through fieldwork (site visits) and a call to representatives of local communities and bathing site managers to provide the spatial framework of all locations where bathing activities take place. The spatial dimensions of all bathing sites (land outline) were defined in two coordination meetings with all participants in the MSP-MED project (Čok et al., 2022), using the land use and others GIS database. Certain tolerances had to be taken into account (not updated or mutually inconsistent databases), but according to the participants, the deviations in the results were less than 5%.

In the **third phase**, the capacity of all bathing sites was calculated. In a first step, data from the official bathing site registers maintained by the ARSO and additional data from the managers of the bathing sites were obtained. In the second step, the size calculation in m² was carried out for all bathing sites, followed by a capacity calculation in relation to the maximum number of bathers, using the applicable standards setting out the conditions for safety against drowning. Of particular relevance here were the Rules on technical measures and requirements for the safe operation of bathing sites and for protection against drowning in bathing sites (2007), which for

¹ Note: Regarding the numerical data, the article refers to the results of the project Information Support for Maritime Spatial Planning at Local Level: Spatial Planning in the Coastal Zone developed in the framework of MSP-MED (Čok et al., 2022).



Figure 3: Simon's Bay Beach, Izola, as a formal bathing site listed in the official registers (Photo: Čok, 2023).

the land part specifies an area of 7 m² for each bather as the minimum standard necessary for the proper implementation of sunbathing, relaxation and rest activities. In the third step, the partial results were synthesised and the key findings presented using the comparative research method.

RESULTS

Legal status and terminological definitions of natural bathing sites

Based on a review of a number of sources, it was found that there are different records of bathing sites for the Slovenian coast. Particularly crucial were the records kept by the institutions within their respective authorities and tasks, i.e. the Environment Agency of the Republic of Slovenia (ARSO), Ministry of Natural Resources and Spatial Planning, local communities (municipal services) and individual bathing site managers (concessionaires). In addition, a number of other records held for their own purposes by tourist associations, agencies, spatial development projects, etc., which also included certain data on individual bathing sites, were examined.

At the beginning of the discussion, it is necessary to first draw attention to terminological consistencies. The basic definition distinguishes swimming pools and natural bathing areas. Swimming pools are indoor and outdoor swimming pools. Natural bathing areas are

bathing sites in the sea, on still and moving waters (MSP, 2021). In practice, the term beach is also used colloquially for natural bathing areas. Of course, it is necessary to distinguish between their land and water parts. As a rule, the water part is declared as bathing water, which means that seawater quality monitoring is carried out in these areas, and as such they are intended for bathing. Bathing waters are defined sequentially, but this does not mean that bathing areas or beaches are formally defined on the whole bathing water sequence.

Based on a review of the available sources (Water Act, 2020; Act on Protection Against Drowning, 2007; MSP, 2021; Atlas of Waters, 2023), which determine the status of water and land areas, as well as their location and spatial extent, the following three definitions were found:

1. **Bathing waters** and **bathing areas**, as defined by law and as determined by official records in the area (bathing waters shall be waters where a large number of people bathe or are expected to bathe, or where bathing is practiced as a direct water use for bathing area activities, and where bathing is not permanently prohibited or permanently advised against. A bathing area shall be the bathing water area where a large number of people bathe or are expected to bathe, or where bathing is not permanently prohibited or permanently advised against, including the appertaining waterside land (summarized by Water Act, 2020 and Act on Protection Against Drowning, 2007)).

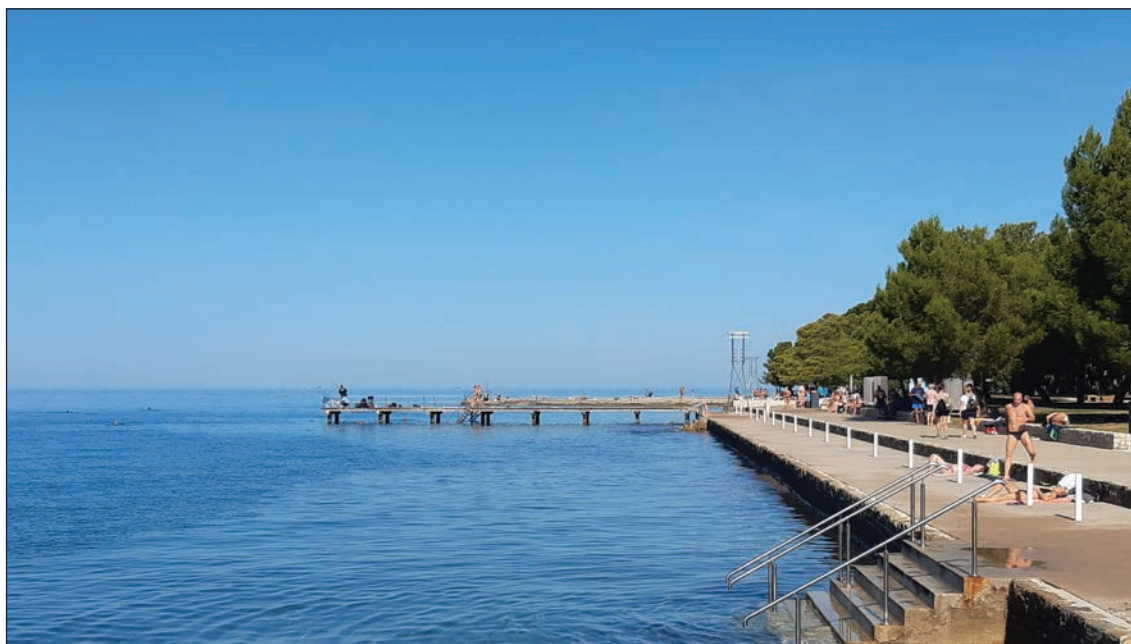


Figure 4: Bathing site Pod Belvederjem, Izola, as an informal bathing site not listed in the official registers (Photo: Čok, 2023).



Figure 5: Bathing area Salinera - Pacug, Piran, as an informal bathing area not listed in the official registers (Photo: Čok, 2023).



Figure 6: Bathing area Salinera - Pacug, Piran, as an informal bathing area not listed in the official registers (Photo: Čok, 2023).

2. **Areas of natural bathing sites** with a water permit,² as defined by law and listed in the Atlas of Waters and other official records (a natural bathing area shall be a bathing water area where bathing is practiced as a direct water use for bathing area activities and in accordance with the regulations governing protection against drowning, including the appertaining infrastructure (summarized by Water Act, 2020 and Act on Protection Against Drowning, 2007)).
3. **Other areas** where bathing activities are also carried out (other bathing sites) but are not registered in official records and do not have a water permit. The local communities alerted us of their

occurrence (exact location and extent) and also provided us with detailed information.

In the material under consideration, various terms or colloquial terminology were also found in the official records. Among them are terms that separate water and land parts, or combine them, e.g.: sea bathing place, beach, beach arrangement, beach area, beach for swimming, sea for swimming, etc.

On the basis of the above, therefore, a distinction must be made between: (a) those bathing areas (or sites) listed in the official registers (formal bathing areas or sites Figure 3 & 4) and (b) all the others (informal bathing areas or sites, Figure 5 & 6).

² In Slovenia, a water permit is a special permit that must be obtained for a certain special use of water, e.g. for technological purposes, bathing, ports, commercial use, etc. It therefore serves to control and regulate the use of large amounts of water or to use it for special purposes. The water permit can also determine the obligation and method of monitoring natural phenomena related to the special use of water or marine resources, as well as monitoring the impact of facilities and devices on the water regime.

Inventory of natural bathing areas and sites in official records and other sources

Based on the analysis of cartographic data and statistical records, and interviews with representatives of local communities (official records and informal sources), we found that in the area of all four coastal municipalities there are: 21 bathing water areas (water part), 17 natural bathing sites in the bathing water area (with and/or without a water permit) and additional 29 other bathing sites (without a water permit and/or without an entry in official records). The proportional share of the latter is particularly surprising, as spatial planning acts and sectoral records have been in force in Slovenia for decades. Table 1 gives the names of bathing waters and bathing areas as given in official records (all bathing locations are listed in Table 2). The share of those included in the registers but do not currently have a valid water permit is also surprising. It can be seen that these registers also lack harmonised terminology (e.g. bathing water No 10 where the term 'beach' is used for bathing water).

It can also be seen that in most cases the designation of bathing water follows the designation of the tourist complex in question on the coast. This is a consequence of the already mentioned concept of urbanisation of the Slovenian coast, in which the use of land and sea was coordinated at least in the initial phase.

Overview of the spatial conditions and the calculation of spatial extent and capacity

In the third part, the research focused on recording the actual spatial conditions. In the first step, all existing bathing areas (formal and informal) in the area were located and recorded, using various sources. The following was noted:

Municipality of Ankaran

In the coastal strip of the Municipality of Ankaran (Figure 7) there are two bathing sites listed in official records, i.e. Debeli Rtič and Adria. There are other seven areas or sites where bathing is also practised. In spatial terms (accessibility, slope of the hill, availability of space), a considerable part of the coastline in this municipality is suitable for bathing, so it is not surprising that bathing activities take place in many locations in both the northern and southern part of the Ankaran Peninsula. The highest pressure was recorded at Debeli Rtič, around which bathing waters have been officially declared. From the point of view of traffic accessibility, the coastal strip of the municipality is closest to the central part of the national territory, from where most one-day visitors come.

City Municipality of Koper

The coastal strip of the Municipality of Koper has the fewest bathing locations of all municipalities. There are two bathing sites directly adjacent to the town of Koper, which are listed in the official registers (Koper City Bathing Site and the Koper-Izola Bathing Area). There are two more bathing areas without formal status in the direction of Izola. A large part of the coastal strip in the area of the municipality is occupied by the Port of Koper, so bathing is limited only to the area west of the city. In this part, substantial expansions of bathing areas are planned (in formal terms, but in fact they already exist), as with the new spatial arrangements the coastal strip between Koper and Izola will be focused on recreational and leisure activities. The Koper bathing sites are also attractive because of other urban functions of the city, as being the central administrative and economic centre of the Slovenian coast. With the future development of the area of the former Koper-Izola coastal road, the attraction of this area will be further enhanced.

Municipality of Izola

In the coastal zone of the Municipality of Izola (Figure 8) there are many bathing sites and areas, mainly due to the favourable spatial conditions and the traditional tourist orientation of the town of Izola. Of these, three are included in the formal registers (Beach for the Blind and Visually Impaired, the bay of Delfin and Simon's Bay) and there are eight other locations where intensive bathing is practised. In the Municipality of Izola, bathing waters have also been declared on most of the coastal strip, which further stimulates this activity. In fact, only the coast directly in the marina area is exempted from bathing waters. The greatest additional potential is the area of the coastal road in the direction of Koper, which both municipalities manage with a common approach and coordinated programme concept (regulated bathing sites are a priority).

Municipality of Piran

The Municipality of Piran, with the conurbation of Piran - Portorož - Lucija, is the central destination of Slovenian coastal tourism. Its coastal strip has the largest number of bathing sites and areas (among all the municipalities) with a total of twenty-two. Ten bathing sites are included in the official registers (Krka Strunjan, Salinera, Pacug, Fiesa, Bernardin, Vila Park Hotel Beach, Meduza, Portorož Central Beach, Lucija Beach and Lucija Campsite), and an additional twelve sites have been registered.

Table 1: List of bathing waters and bathing sites as recorded in the official records (Source: Čok et al., 2022).

Bathing water no.	Municipality	Bathing water (official name)	Bathing area / site (with water permit)
1	Ankaran	Debeli rtič bathing area	DEBELI RTIČ NATURAL BATHING AREA*
2	Ankaran	RKS MZL Debeli rtič natural bathing area	RKS MZL Debeli rtič natural bathing area
3	Ankaran	Adria Ankaran bathing site	Adria Ankaran bathing site
4	Koper	Koper city bathing site	Koper city bathing site ("Mokra mačka")
5	Koper	Žusterna bathing site	Žusterna bathing site**
6	Koper/Izola	Žusterna bathing site - AC Jadranka	**
7	Izola	Pri svetilniku bathing area	Pri svetilniku bathing area
8	Izola	Delfin natural bathing area	Delfin natural bathing area
9	Izola	Bathing area Rikorvo - Simon's Bay	***
10	Izola	Simon's Bay Beach	Simon's Bay Beach
11	Izola/Piran	Bathing area Simon's Bay - Strunjan	***
12	Piran	Seaside bathing site - Krka beach - Health Resort Strunjan	Seaside bathing site - Krka beach - Health Resort Strunjan
13	Piran	Salinera natural bathing area	Salinera natural bathing area
14	Piran	Bathing area Salinera - Pacug	Bathing area Salinera - Pacug****
15	Piran	Bathing area Fiesa - Piran	Bathing area Fiesa - Piran****
16	Piran	Grand Hotel Bernardin beach	Grand Hotel Bernardin beach
17	Piran	Vila Park Hotel beach	Vila Park Hotel beach
18	Piran	Hoteli Morje bathing site	Hoteli Morje bathing site
19	Piran	Portorož central beach	Portorož central beach
20	Piran	Metropol Portorož natural bathing area	Metropol Portorož natural bathing area
21	Piran	Lucija Campsite natural bathing area	Lucija Campsite natural bathing area***

* the only one that has a proper name, the other bathing areas are unnamed

** Part of the bathing water is located in the Žusterna bathing water (most of it), and the other part in the Jadranka AC (a small part)

*** no bathing site with a water permit on record

**** extraction only-Pacug; no water permit (Fiesa)

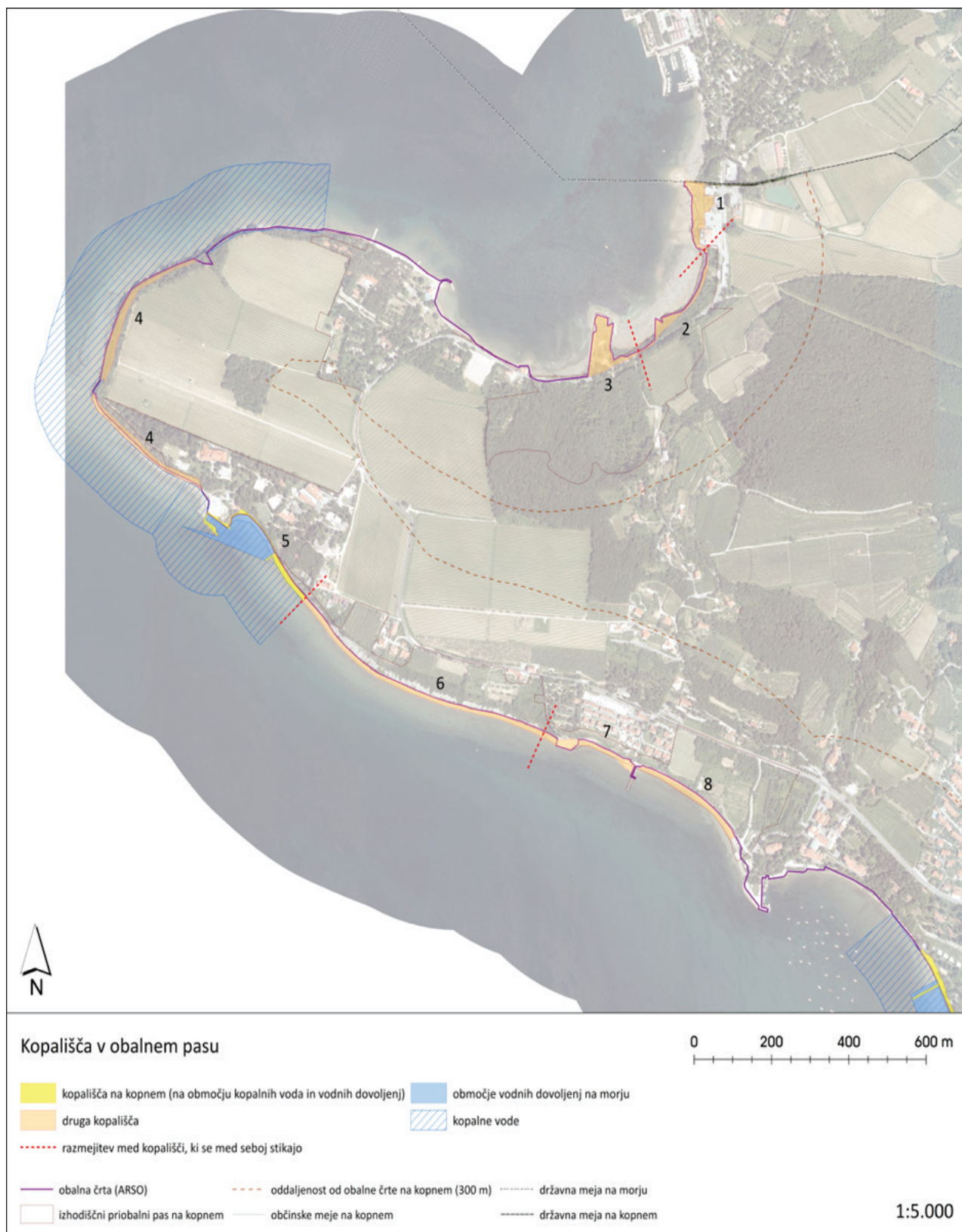


Figure 7: Bathing areas and sites in the Municipality of Ankaran (section), an example of the recording of the spatial conditions (Source: Čok et al., 2022).

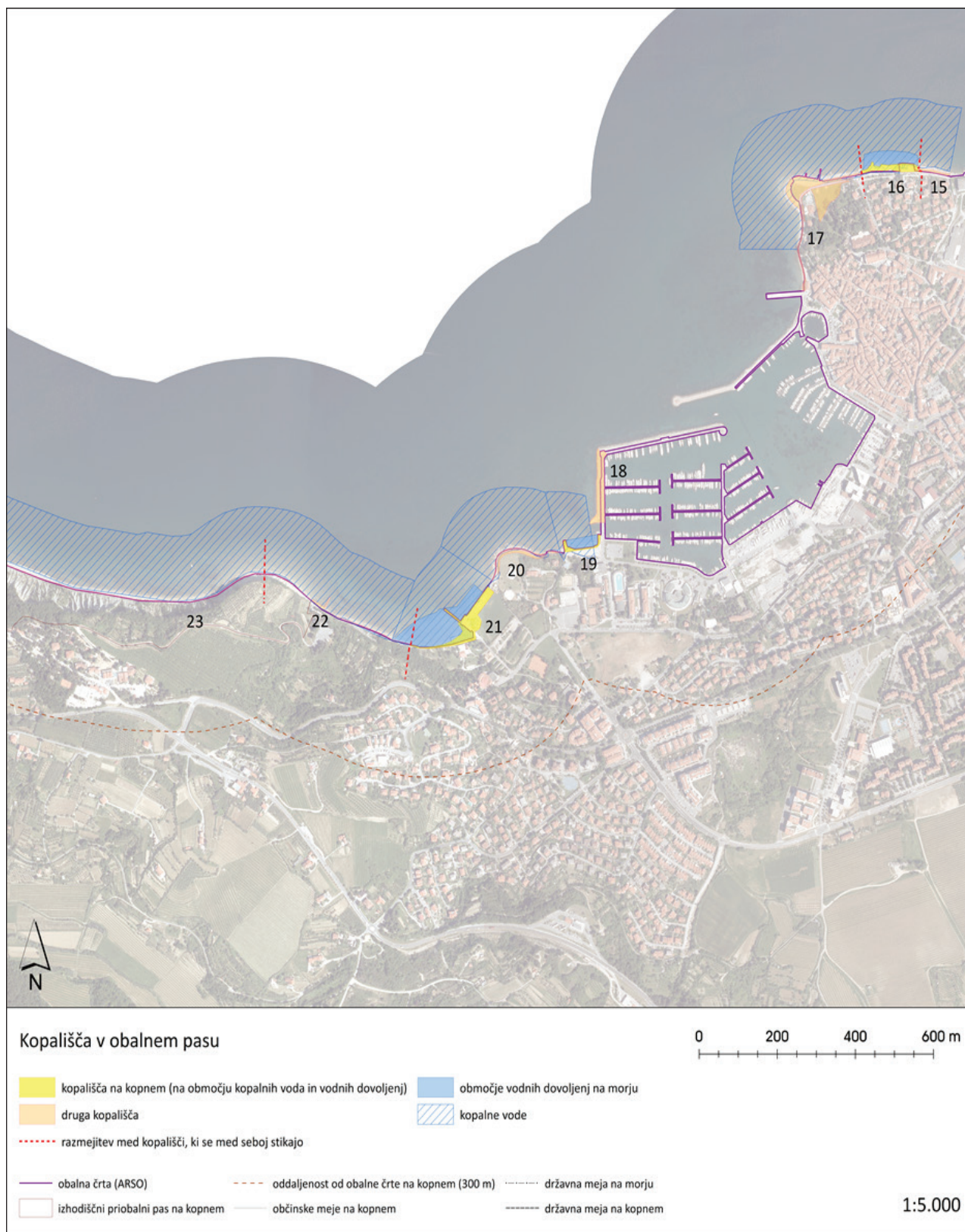


Figure 8: Bathing areas and sites in the Municipality of Izola (section), an example of the recording of the spatial conditions (Source: Čok et al., 2022).

However, a considerable discrepancy was found between bathing waters and the situation on land, which is clearly a consequence of the current lack of coordination between maritime and land-use spatial planning. The central area for sunbathing and bathing is the coastal area in the settlement of Portorož, which, in addition to the most favourable spatial conditions (a closed bay protected from winds and waves, low sea level, etc.), also offers the highest density of tourist activities and services (accommodation, catering, entertainment, etc.).

Calculation of the capacity of natural bathing sites and areas

In the next step, we synthesised data on the location and status of all bathing sites and areas and identified their capacity. In the first part, we summarised the data from the official records, which are mainly held by the managers and the competent services. Unfortunately, in certain cases, the data were incomplete or not available, so we made our own calculation. We defined the size of the bathing areas on land and used the current standard of 7 m² per bather as the minimum area laid down in the regulations. We also calculated the length of bathing waters, as noted in the official records.

Regarding the size of bathing waters, the following findings were made:

The starting point for the calculation of bathing waters is the length of the coastline (ARSO), namely 52.641 km. The total sum of all 21 bathing water areas (projection to the coastline) amounts to 16,509 km. This means that more than a third (31.3%) of the coastline offers conditions for bathing or for the development of natural bathing sites (and areas) from the point of view of bathing water quality.³ This naturally raises an interesting question: why are bathing waters declared on such a large scale if there are no bathing facilities planned on land?

In terms of the size and/or capacity of the natural bathing sites, the following findings were made:

- A collection of data on the capacity of bathing sites or areas from official records was produced by ARSO in the years 2008–2011 and can be found in the Profiles of Sea Bathing Waters (2023). According to these data, the total capacity of the 21 listed bathing sites is 14,400 bathers.
- In the course of work, and in particular in consultation with both the representatives of the local communities and the representatives

of the ARSO and the operators of the bathing sites or areas, we found that the data were not updated and/or significantly deficient and therefore did not constitute an appropriate starting point for the definition of actual capacities. As such, they merely reflected the situation more than ten years ago, and only for certain bathing sites.

- In order to produce an accurate assessment of individual bathing sites or areas, it would be necessary to analyse the spatial situation of each individual location, taking into account various parameters such as: project documentation (where available), count of visitors at different time intervals, verification of land ownership, compliance with the strategy and the intended use outlined in municipal spatial planning acts, integration with the public transport network (Huamantínco Cisneros et al., 2016), etc. Such an analysis was beyond the financial and time frames of the study in question and was therefore not carried out.
- However, an indicative capacity calculation was carried out using the standard of 7 m² per bather (Table 2)⁴. The gross surface of bathing areas from official records (plan view of natural bathing areas) and also all other bathing areas not evidenced in official records were used as project area (Figure 9). The definition of these other locations was carried out by the local communities, who monitor the situation in the area. The assumption was that only the width of 1 m of the coastal strip was taken into account as the actual or potential width of the bathing site in the locations directly under the steep cliffs (the influence of tides occurs in six cases).

On the basis of this calculation, it can be concluded that (Table 3):

- the total capacity of the so-called natural bathing areas and sites in the bathing water zone (with a water permit) is 1,711 bathers in the Municipality of Ankaran, 2,441 bathers in the Municipality of Koper, 1,193 bathers in the Municipality of Izola and 17,236 bathers in the Municipality of Piran, or 22,609 bathers in all four municipalities for a total of 17 bathing areas;
- the total capacity of the so-called other (informal) bathing areas and sites is 3,570 bathers in the Municipality of Ankaran, 5,180 bathers

³ In bathing water areas, competent institutions carry out monitoring and publicly publish data.

⁴ In the eight highlighted (*) cases, due to the unique spatial conditions (a narrow coastal strip beneath the cliffs, further restricted by the tide), a reduced area of a 1 m wide coastal strip was taken into account in the capacity calculation. The bathing area number 13 is partly in the municipality of Koper and partly in the municipality of Izola, in the numerological sense it is treated as one, that is why there are 45 and not 46 locations in this list.

Table 2: Overview of the names, sizes and carrying capacities of all bathing locations, based on the 7 m²/bather approach (Source: Čok et al., 2022).

Id	Name Bathing site / area / beach (all) Has a valid Water Permit (WP)	Municipality	Surface area (m²)	Surface area (m²)* reduced	Max no. of bathers (7 m²)
1	Lazaret 1	Ankaran	5392.4	-	770
2	Lazaret 2	Ankaran	2943.1	-	420
3	Lazaret 3	Ankaran	7077.8	-	1011
4	Debeli rtič*	Ankaran	11330.3	788.65	112
5	Debeli rtič (WP)	Ankaran	3035.4	-	434
6	Under the vineyards (pod vinogradi)*	Ankaran	8377.5	709.4	101
7	Existing student beach (plaža študent)	Ankaran	3767.2	-	538
8	Oltra	Ankaran	4316.3	-	617
9	Adria (WP)	Ankaran	8946.6	-	1278
10	Koper city bathing site ("Mokra mačka") (WP)	Koper	5876.7	-	840
11	Semedela bathing area (Seaside Park)	Koper	34930.5	-	4990
12	Žusterna bathing site (WP)	Koper	11210.8	-	1602
13	Bathing area Koper - Izola (in the City Municipality of Koper)*	Koper	6179.3	1337.6	191
13	Bathing area Koper - Izola *	Izola	9078.4	1455.8	207
14	Jadranka	Izola	8861.7	-	1266
15	"Šampjera" by the cliff	Izola	465.4	-	66
16	Beach for the Blind and Visually Impaired (WP)	Izola	2158.7	-	308
17	Lighthouse (Svetilnik)	Izola	8445.4	-	1206
18	Jetty (Valobran)	Izola	3686.7	-	527
19	Delfin (WP)	Izola	732.9	-	105
20	"Pebble beach" ("Na kamenčkih")	Izola	1538.2	-	220
21	Simon's Bay (WP)	Izola	5463.2	-	780
22	Pod Belvederjem*	Izola	618.0	415.5	59
23	Strunjan	Izola	2101.1	-	300
24	Krka Strunjan (WP)	Piran	14967.3	-	2138
25	Salinera (WP)	Piran	17245.6	-	2464
26	Bathing area Salinera - Pacug*	Piran	1195.3	597.1	85
27	Pacug (WP)	Piran	5293.0	-	756
28	Area used for bathing Pacug - Fiesa*	Piran	1037.2	520.1	74
29	Fiesa (WP)	Piran	13821.6	-	1975
30	Bathing area Fiesa - Piran*	Piran	2449.8	1225.2	175
31	Punta	Piran	8667.6	-	1238
32	Riviera - Fornače	Piran	4052.9	-	579
33	Fornače	Piran	1784.1	-	255
34	Bernardin (WP)	Piran	4743.4	-	678
35	Lepa Vida	Piran	4551.1	-	650
36	Vila Park Hotel beach (WP)	Piran	11853.9	-	1693
37	Children's beach at the club	Piran	1111.0	-	159
38	Korotan	Piran	2818.4	-	403
39	Meduza (WP)	Piran	10863.7	-	1552
40	Portorož central beach (WP)	Piran	19316.2	-	2759
41	Lucija Beach (WP)	Piran	19959.1	-	2851
42	Marina 1	Piran	1981.7	-	283
43	Marina 2	Piran	4417.2	-	631
44	Lucija Campsite (WP)	Piran	2779.8	-	397
45	Seča	Piran	21707.5	-	3101

in the Municipality of Koper, 3,851 bathers in the Municipality of Izola and 7,632 bathers in the Municipality of Piran, or 20,235 bathers in all four municipalities for a total of 29 bathing locations;

- the total capacity of all bathing locations (those included in the official registers and all others) is thus 42,781 bathers. This estimate is significantly higher than the previously stated 14,400 bathers (ARSO).

It should be stressed that this total represents a theoretical maximum which in practice would probably be difficult to reach, let alone exceed. In fact, the capacities of formal bathing areas are already very large, which is also pointed out in the Regional Strategy (2006).

DISCUSSION

The results shown represent a comprehensive cross-section of the situation in the field of natural bathing areas and bathing sites, both from the point of view of official records and the actual situation in the physical space (situation in 2022). Although the quantitative data (number of bathing areas, sites, their surface area and capacity) are methodologically generalised, we believe that they give a sufficient overview of the real spatial potential and the need for further improvement of the existing system of their recording.

To carry out a more precise analysis or even an assessment of the carrying capacity of an individual bathing location, other parameters would also have to be taken into account and a number of specific data on the area and visitors would have to be obtained, which was not covered by

this study (Huamantín Cisneros et al., 2016). The implementation of such an assessment is associated with certain financial, time and other challenges. At least mention should be made here of the eventual capture of data by means of video technology, as one of the most effective methods of monitoring the situation in bathing sites (stationary cameras, drones, sensors, etc.), which, on the other hand, is questionable from the point of view of the competences for implementation, the interference with personal data, etc. The question is also raised from the point of view of expediency, since many bathing sites, in particular formal ones, have already been placed chronologically in a certain environment and have become an acceptable fact for other interests in the narrower environment. Nevertheless, their capacities and potentials are sufficiently well known to the operators.

A bigger problem are informal bathing areas and sites, which as a rule lack adequate support infrastructure and monitoring. An additional problem is their geographical dispersion. On the one hand, this situation offers greater possibilities for exercising the right to bathe and thus the right to use the sea and the coast (Gosar, 2000) as a public good (civil right) (Alterman & Pellach, 2022). On the other hand, this dispersion may present more possibilities for the emergence of negative environmental impacts, such as uncontrolled accumulation of waste, the construction of unauthorised swimming piers and boat ramps, uncontrolled parking on agricultural land, etc. These problems are pointed out by both citizens and local communities, who are faced with an uncontrolled situation in the area, especially during peak seasons (Cigale, 2012). Additional conflicts also arise in the field of navigation safety, as bathers interfere with the navigation

Table 3: All bathing sites (locations) capacity per municipality and in total (Čok et al., 2022).

	Ankaran			City Municipality of Koper			Izola			Piran			TOTAL		
	number	surface area (m ²)	no. of bathers m ^{7/2}	number	surface area (m ²)	no. of bathers m ^{7/2}	number	surface area (m ²)	no. of bathers m ^{7/2}	number	surface area (m ²)	no. of bathers m ^{7/2}	number	surface area (m ²)	no. of bathers m ^{7/2}
A: bathing sites with bathing w./ water permit	2	11982.0	1711.7	2	17087.5	2441.1	3	8354.8	1193.5	10	120843.5	17263.3	17	158267.8	22609.5
B: other bathing sites	7	43204.6	3570.0	2	41109.8	5180.8	8	34794.8	3851.6	12	55773.7	7632.6	29	174883.1	20235.0
<i>total</i>	9	55186.6	5281.7	4	58197.3	7621.9	13	43149.7	5045.2	22	176617.2	24896.0	46	333150.9	42781.9

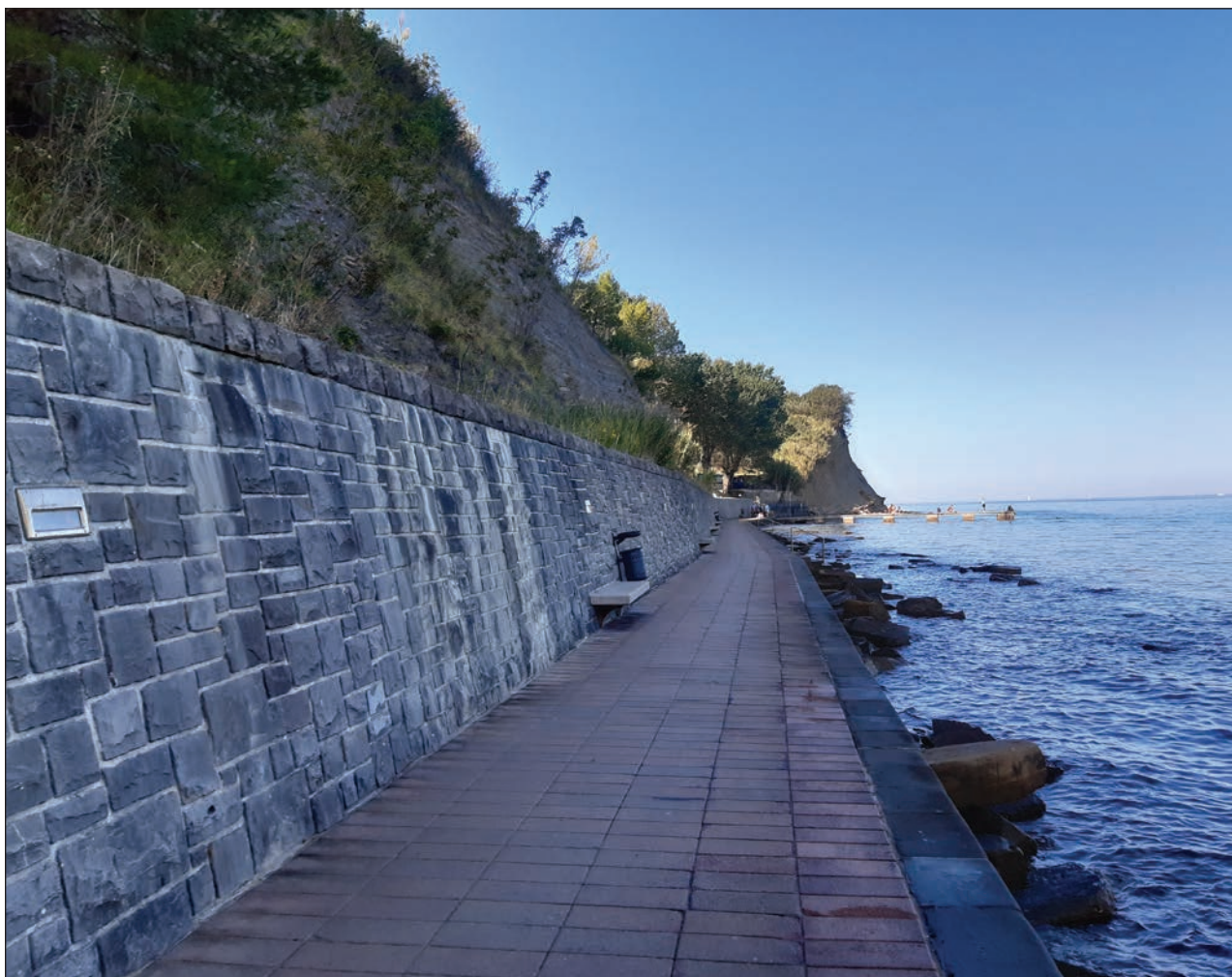


Figure 9: Bathing site Pod Belvederjem, Izola, the area usable for sunbathing is very narrow in some cases. Available GIS data were used for the calculation (Photo: Čok, 2023).

corridors of coastal shipping in many areas not intended for bathing.

The results presented will in future be of particular help to municipalities, which are faced with specific tasks in the planning of spatial interventions in the coastal zone, imposed by the sectoral legislation and, in addition, by the MSP. They will contribute to the creation of the assessment of the carrying capacity of the sea and the coast (in preparation), to the preparation of municipal detailed spatial planning acts for the future coastal zone management (MSP, 2021), to the preparation of more appropriate records and monitoring in the bathing areas and sites and as a supplement to the records for existing operators (concessionaires). The results will also be useful for all other institutions dealing with this issues (ARSO, etc.). In addition to their importance in terms of establishing records, we also see their role in the preparation of new local strategies for the

development of tourist infrastructure. Namely, all four coastal municipalities are planning to increase their accommodation capacity over the next decade. The data presented can be used as a reference point or as a guide in the planning of the points of interest in the area, as generators of coastal tourist migration (Andrade, 2022).

CONCLUSIONS

The Slovenian coast offers favourable conditions for bathing activities. In this sense, a number of natural bathing sites have been created in the area, both in the locations designated for this purpose and in other locations where the space or the absence of other land uses allow for sunbathing and bathing activities. Various institutions maintain records of spatial conditions, but in many cases their data are incomplete or not updated.

In our research, we found that the total number of all natural bathing areas and sites in the Slovenian coastal strip is 46. Of these, 17 are located in the area of bathing waters and have a water permit. These bathing locations are listed in official records. They have a total area of 174,883 m² and a capacity of 22,609 bathers. In addition, there are 29 bathing areas and sites in locations that are not primarily intended for bathing (although some of them are located in bathing water areas) and are classified as informal bathing sites or areas. They have a total area of 174,883 m² and a capacity of 20,235 bathers.

The total capacity of all considered, i.e. formal and informal bathing areas and sites, is thus 42,781 bathers. This estimate is almost three times higher than the official records (ARSO) which indicate a capacity of 14,400 bathers. Based on the above, we can conclude that there is a real need to establish a more efficient approach to spatial recording than the existing one.

Of course, the issue described must be considered in the context of changing social values. Spatial capacity is certainly an important element of spatial planning and management, but the greater challenge in this process is the behaviour of users, their expectations and demands. The increase in green tourism and general environmental awareness are driving the trend towards the preservation of natural bathing sites, while at the same time the need of visitors for support services is accelerating the establishment of support infrastructures virtually everywhere. Lastly, natural bathing sites are open public spaces in an area with very high physical and environmental constraints, where many other interests in the use of the sea and the coast are also present.

Although the given figures on the extent and capacity are generalised, they clearly indicate the need for a more precise and careful approach to the future management of this sensitive coastal area.

FORMALNA IN NEFORMALNA NARAVNA KOPALIŠČA IN PLAŽE V SLOVENSKEM OBALNEM PASU – IZZIVI NA PODROČJU EVIDENTIRANJA IN NAČRTOVANJA

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POVZETEK

Slovenska obala ponuja ugodne pogoje za dejavnosti kopanja in sončenja, zato so se v prostoru izoblikovala številna naravna kopališča in plaže. V članku so predstavljeni rezultati raziskave, ki je bila usmerjena v evidenco njihovega pravnega statusa, števila, obsega in kapacitet. V tem okviru smo izvedli pregled uradnih evidenc, analizo stanja v prostoru, konzultacije z lokalnimi skupnostmi ter upravljavci kopališč. Uporabljeni sta bili deskriptivna in primerjalna raziskovalna metoda. Na podlagi pridobljenih podatkov smo izvedli izračun obsega in kapacitet vseh kopališč. Ugotovili smo, da podatke o kopališčih vodijo institucije tako na državni kot lokalni ravni. Žal so obstoječe evidence nepopolne, težavo predstavlja tudi večkrat nedorečen pravni status (formalna in neformalna kopališča) in neusklajena terminologija (kopališča, plaže, kopalna območja ipd.). Glede števila in prostorske razporeditve smo ugotovili, da se poleg 17 kopališč, kot jih vodijo uradne evidence, v prostoru nahaja še dodatnih 29 lokacij, kjer se tudi izvajajo dejavnosti kopanja in sončenja. Dodaten izziv predstavlja evidentno neskladje med formalno opredeljenimi kopalnimi vodami (vodna zemljišča, ki se razprostirajo po tretjini obalne linije) in kopališči na kopnem. Z izračunom obsega (zemljišča na kopnem v m²) in kapacitet (7 m²/kopalca kot minimum) smo ugotovili, da vseh 46 kopališč skupaj omogoča nastanitev 42.781 kopalcev. Ta ocena skoraj trikrat presega uradne podatke, kar naslavlja potrebo po nadgradnji obstoječega sistema evidentiranja stanja v prostoru. Predstavljeni rezultati bodo v podporo zlasti institucijam, ki jim nedavno sprejeti Pomorski prostorski plan Slovenije nalaga pristojnosti in naloge za načrtovanje posegov v obalnem pasu. Sem sodi predvsem izdelava ocene nosilne zmogljivosti prostora in posledično usklajeno izvajanje strategije prostorskega razvoja v občutljivem morskem okolju.

Ključne besede: obalni pas, naravna kopališča, plaže, kapacitete, ocena nosilne zmogljivosti kopališča, evidentiranje

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