THE LOCATION OF TOURIST ACCOMMODATION FACILITIES: A CASE STUDY OF THE ŠUMAVA MTS. AND SOUTH BOHEMIA TOURIST REGIONS (CZECH REPUBLIC)

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Abstract

The impact of various characteristics of geographic space on the location of tourist accommodation facilities is assessed in this paper. Spatial indicators, nearest-neighbour analysis, kernel estimation of the probability density of occurrence, analyses of distances and location in selected environments were used. Hotels create spatial clusters situated mainly in urbanized areas. The predominant occurrence of guesthouses moves from urban areas to colder higher altitudes and to countryside pond areas. Hostels are strictly related to towns, and camps and resorts are situated primarily near water surfaces in warmer areas.

Shrnutí

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Cílem příspěvku je identifikace vlivů různých charakteristik míst a prostředí na lokalizaci ubytovacích zařízení. Využito bylo prostorových indikátorů, analýzy nejbližšího souseda, jádrového odhadu pravděpodobnostní hustoty výskytu a analýzy vzdáleností a polohy ve vybraných prostředích. Hotely se vylišují především svou lokalizací do urbanizovaných prostorů. Převaha výskytu penzionů je posunuta z městského prostředí do chladnějších vyšších nadmořských výšek a do venkovských rybničních oblastí. Turistické ubytovny jsou lokalizovány výhradně do měst. Kempy a rekreační střediska jsou lokalizovány především do blízkosti vod v teplejších oblastech.

Keywords: *lodging, tourism, locate, model, Šumava Mts. and South Bohemia tourist regions, Czech Republic*

1. Introduction

The spatial organisation of tourism has been a core topic in both Slovak and Czech geographical scientific studies for several decades (Vystoupil and Kunc, 2009). These studies have been focused primarily on problems related to the distribution of 'attractiveness', regardless of whether this was in terms of preconditions or potential. Much less attention has been paid to problems directly related to the geography of the material-technical base location. From the viewpoint of the tourism business, it is primarily a matter of accommodation facilities – except for large hotels (Bučeková, 2007), second housing (largely staying beyond the market supply: Fialová and Vágner, 2005) and more recently, modern forms of accommodation (Kadlecová and Fialová, 2010). Taking into account the fact that problems of second housing attract high levels of attention in both Czech and Slovak literature (summarized by Vystoupil et al., 2010), we will focus entirely on the free capacity of accommodation.

Accommodation facilities are basic elements of the material-technical base of tourism (Mariot, 1983), since they facilitate the visitors' stay in a destination and constitute a basis for the further development of the destination (Goeldner and Ritchie, 2009). This is the reason why they are considered to be a core source for the sustainable competitiveness of a destination (Ritchie and Crouch, 2003) and their lack "acts as a constraint on overnight visitor numbers" (Ritchie and Crouch, 2003, p. 246). Building up the accommodation capacities is one of the essential parts of the process of planning tourism development in destinations (Goeldner, Ritchie, 2009), as the location of hotels constitutes a part of the development of

the regions (Bégin, 2000). The location of hotels also influences the activities of tourists (Shoval et al., 2011).

Patterns in the distribution of accommodation facilities reflect an immensely complex spectrum of factors and conditions that have an impact on this part of the tourism sector (for literature reviews, please see Urtasun and Gutiérrez, 2006, and Aliagaoglu and Ugur, 2008). The basis of these factors and conditions is represented by constraints and opportunities resulting from both the environment of a location and from the enterprise itself (Chung and Kalnins, 2001), the space-time diversity of which brings various competitive advantages (Kalnins and Chung, 2004). As the basis of the location of accommodation facilities, the presence of a tourist attraction is stated as being something towards which the visitors are pulled by an attractive force (Ritchie and Crouch, 2003). In the location of accommodation, the distance decay function manifests itself – with regard to the attraction's location (Prideaux, 2002) – as the typical tourist wanting to be within walking distance of tourist attractions (Arbel and Pizam, 1977).

Besides these two properly geographic problems, another important element of location is the benefit from the agglomeration of economic activity (discussed for example by Head et al., 1995 or Johansson and Quigley, 2004), that predestine entrepreneurial entities for creating spatial clusters (Porter, 2000). To a certain measure, a principle of differentiation stands in opposition to the last cited very strong driver, the basis of which is the aim of an accommodation facility to become different from their competitor. This holds true for the location of accommodation facilities, too. Regarding the agglomeration and differentiation forces, the location of an accommodation facility is given by the following rule: "by conforming, businesses obtain positive externalities and, by differentiating, they avoid the negative impact of direct competition associated with high levels of absolute conformity and possibly achieved competitive advantage" (Urtasun and Gutiérrez, 2006, p. 398).

Previous analyses of spatial links of accommodation facilities' location were focused mainly on hotels and hotel chains. From the perspective of geographic characteristics of locations (testifying the absolute position of the hotel), a wide range of models were created concerning the hotels' location in urban structures (Bučeková, 2001). Among basic models, we have to cite locations given by socio-economic gravitation and transportation accessibility. The first group comprises locations in the historical centre, in the area between the historical centre and the central business district and in an attractive location. The second group includes locations near the main railway station, along the main road connecting the town with other centres of the urban system in the area or along the road connecting the town centre with the airport (simplified, according to Bégin, 2000; Aliagaoglu and Ugur, 2008). In the Central European milieu, we can also complete the above-mentioned examples by including hotels situated in large housing estates (Bučeková, 2001).

The relative position of hotels was studied based on their geographic distance, supply price, size and services offered (Urtasun and Gutiérrez, 2006). A general trend towards clustering was discovered (Kalnins and Chung, 2004) and many "studies point to the tendency of accommodation to concentrate in the city centre, which is usually the location of the historical core and of most attractions" (Shoval and Cohen-Hattab, 2001, p. 911). In any case, a shift in the location of large hotels was confirmed rather towards the economic centre of the town than towards the historical one: this is documented for example by quickly developing tourism in the Chinese Xiamen (Bégin, 2000). This phenomenon could be related also to the process of de-concentration in the location of hotel facilities (Bučeková, 2007) and to their move towards town peripheries with better accessibility (Shoval and Cohen-Hattab, 2001) and to spatial changes within urban areas (Klusáček et al., 2009) and other economic and social changes in post-communist countries (Stiperskia and Lončar, 2011). A connection was also confirmed between the distance of the hotel's location from the town centre and the type of visitors: "hotels close to the centre unquestionably host a significantly higher percentage of individual tourists than they do tourists belonging to tour groups" (Shoval, 2006, p. 70).

However, these general trends have more actual variants since an influence of the accommodation facility's size and concrete environment on the location was found. A crucial variable in creating spatial clusters is the size of accommodation facilities and their pertinence to hotel chains, as found in results from the analysis of rules in the distribution of Texas hotels (Chung and Kalnins, 2001). Models explaining the processes of the clustering of large and small service providers within one area bring quite often opposing results (compare the results of Chung and Kalnins, 2001; Kalnins and Chung, 2004; Urtasun and Gutiérrez, 2006). One of the reasons could be different costs for building up a facility – hotels "are permanent structures, which grace the landscapes for a long time" (Goeldner and Ritchie, 2009, p. 461), whereas a significant attribute of small accommodation facilities is their relatively high dispersion in a given space, weak promotion in the locality and rapid coming to existence and end (Bégin, 2000).

Accommodation facilities are not located exclusively in large towns, but also close to core resources and attractions situated outside of urban structures (Correia Loureiro and Kastenholz, 2011), where the main attraction is related to nature and landscape (Walford, 2001) and that go through a phase of economic restructuring (Nevěděl et al., 2011). Similar to towns, a high number of types of accommodation facilities visited by different visitors' segments exist also in rural areas (Albaladejo Pina and Díaz Delfa, 2005). Although accommodation "can be an important source of income in towns and villages, especially if it goes beyond simply providing beds for the night" (Albacete-Sáez et al., 2007, p. 46), research in rural areas on the location of these accommodation facilities has attracted unquestionably a lower interest than hotels in towns and cities. When looking up the official statistics of visit rates in accommodation facilities recorded by the Czech Statistical Office, it is obvious that there are other important accommodation capacities besides the hotels in big towns and cities as a component of destinations' tourism sources.

With regard to the differences found in the location of particular accommodation facilities in various environments, it was decided to opt for the evaluation of differences in the location of particular types of accommodation facilities as the aim of this article. The intention was to answer the following research questions:

- Are there differences in the spatial characteristics of the particular types of accommodation facilities?
- Do the above described location criteria have a different effect upon the location of the different types of accommodation facilities?

The neighbouring tourist regions of the Šumava Mts. and South Bohemia were selected as a study area (Fig. 1). These regions belong amongst the most important destinations for domestic tourism and also, because of their proximity to the state border, as destinations for many foreign tourists.

2. Methods

2.1 Data set

To be able to assess the location of accommodation facilities in the observed areas, it was first necessary to create a territorially localized database of accommodation facilities. Individual accommodation facilities were identified using the Internet network within a three-phase process. The first phase was recording of accommodation facilities registered by tourist information centres in the observed areas. In the second phase, this database was checked and completed with details of accommodation facilities

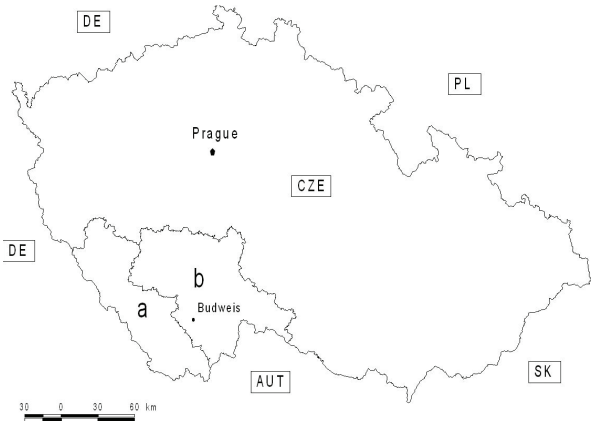

Fig. 1: Study areas within the borders of the Czech Republic, a = Šumava Tourist Region, b = South Bohemia Tourist Region; abbreviations of countries are given in brackets.

mentioned on the websites of individual municipalities. In the third phase, the database was extended by adding accommodation facilities registered on the following servers: *http://www.penziony.cz/, http://www.nadovcu.cz, http://ubytovani.nettravel.cz/, http://www.ubytovani.net/, http://www.hotel-ubytovani.com/, http://kamsi.cz/, http://www.ubytovani.cz/, http://www.levneubytovani.net, http://www.prespat.cz/, http://www.ubytovanivcr.cz/, http://ubytovani.turistik.cz/, http://www.e-ubytovani.eu/, http://www.ubytovani-cechy.cz/ and http://www.tourism.cz/*.

The accommodation facilities were localized over WMS map layers of Cenia (CENIA, 2010–11) in the JANITOR J/2 (Pala, 2008) and Quantum GIS (Athan et al., 2011) environments with the information on the number of beds and accommodation type. To be able to further model the number of visitors, it was necessary to use the typology in accordance with the categories of the Czech Statistical Office – hotel, guesthouse, camp, cottage settlement, tourist hostel and resort. To assign the type of accommodation facility, the marking attributed to the particular facility in the source was used. The number of beds, which was not detectable from available sources, was determined as a whole-number value of the average number of beds in the respective type of accommodation facility contained in our database.

The importance of an accommodation facility was measured using a model number of visitors for the given accommodation facility. The number of visitors was simulated, based on the information from the public database operated by the Czech Statistical Office. Based on the number of beds (Capacities of mass accommodation facilities according to the category in tourist regions (CRU6170PU_TR)) and the number of overnight stays (Visit rate of mass accommodation facilities according to the category in

tourist regions (CRU9010PU_TR)) comprised in this database, we calculated the average occupancy of the individual types of facilities in different categories in 2010. With regard to the fact that most of the necessary data at lower geographic levels is registered as 'confidential,' the calculation was made separately for the tourist regions of South Bohemia and Šumava Mts. (the lower geographic level could not be used). The potential number of clients (C) of a given facility was then expressed as:

$$\mathbf{C = (beds \times days \times occupancy) / overnights}$$

where *beds* = number of beds in the respective accommodation facility, *days* = number of days in the year, *occupancy* = occupancy, and *overnights* = average number of overnight stays in the tourist region. From the perspective of the model of visit rate, the most important type of accommodation in both tourist regions is the hotel, even though guesthouses are comparable in terms of their visit rate (Tab. 1). The category 'cottage settlements' was excluded from subsequent analyses as the number of identified facilities within this category was low.

Type of accommodation	Number of facilities	Number of beds	Potential number of clients (2010)
Hotel	302	19,174	555,630
Guesthouse	1,700	27,593	361,367
Camp	95	8,347	38,598
Hostel	104	6,432	50,976
Resort	58	4,729	61,201

Tab. 1: Numbers of facilities, beds and potential number of clients

2.2 Data analysis

The location of the accommodation facilities was analyzed with the use of a variety of approaches. To answer the first research question, the basic geographical approach to the assessment of the spatial pattern of a point distribution (Robinson, 1998) was used. First, the spatial indices were investigated. The Lorenz Curve, as a simple graphical way of comparing spatial patterns, and the Gini coefficient were used. The problem for both these indicators consists in their relation to the lower territorial units of the observed area. Unfortunately, we did not have at our disposal any official breakdown classification of the two tourist regions into smaller areas or any specified areas that would create these regions (Vágner and Perlín, 2010). The proposal for the new zoning of tourism (Vystoupil et al., 2007) did not solve the problem, as the applied approach is of the typological character. For this reason, we used the version of the tourism zoning from 1981, which although being 30 years old, is the most recent real geographical tourism regionalization on the territory of the present-day Czech Republic. Afterwards, a point pattern analysis was simulated with the application of the nearest-neighbour analysis (Aplin, 1983). The values of R-statistics and z scores were calculated using the Quantum GIS (Athan et al., 2011). In the third step, spatial clusters were modelled (Robinson, 1998) as density maps (Bornmann, Waltman, 2011). High-density areas were identified as areas with kernel estimation values greater than the mean plus two standard deviations (Shi, 2010). The case-side method of kernel estimation was performed by Spatial Analyst 1.0 of ArcView 3.1.

Regarding the second research question, the impact of location criteria was assessed equally by three approaches. First was the assessment of the absolute geographical distance from the nearest element that can make a location more attractive for building up an accommodation facility (having at the same time a point or linear character). Such elements comprise cultural-historical attractions, historical centres, railway stations, important roads (second and higher class) and recreational water areas. The historical centre was identified as a town square or village square over WMS map layers of Cenia, as were the railway stations and stops. To assess the proximity of an important road, it was decided to use the layer 'road' of the product ArcČR 500 (ARCDATA PRAHA, s.r.o.). Furthermore, we used the layer of monuments considered by visitors in tourist regions to be 'important' (Navrátil et al., 2010, p. 56) to assess the proximity of cultural and historic attractions. Finally, to assess the proximity of recreational water areas (Navrátil et al., 2009) that are part of basic tourist elements in the observed areas (Navrátil et al., 2011), we have considered water areas cited in the Atlas of Tourism (Vystoupil et al., 2006) – especially the stretches that are most used for water tourism and the recreational water areas cited in the atlas.

Within the Quantum GIS environment, each accommodation facility was assigned the proximity of the nearest element from each group of the above-mentioned location elements. Differences in average distances among the types of accommodation were investigated by One-way ANOVA with the Tukey unequal N HSD post-hoc tests (Quinn and Keough, 2002).

However, attractions gain the character of polygons, i.e. their location is not influenced by the proximity of a 'certain' point or line, but they are located in a 'certain' environment instead. Due to this finding, the location of

the accommodation facility in attractive environments was further assessed. The types were selected according to preconditions for the location of tourist facilities (Mariot, 1983). Climatic types were determined according to Quitt (1971). Because of the low number of accommodation facilities, the climatic areas were united according to a key similar to the key used in the school atlas of the Czech Republic (Basařová et al., 2001): all cold areas were comprised into the cold temperate area, MT3, MT4 and MT5 into the colder moderately warm area (MW), MT7 and MT9 into the middle MW area and MT10 and MT11 into the warmer MW area.

The types of relief were determined according to framework relief types (Löw and Novák, 2008) united into two groups: *a)* ordinary relief (landscapes of hilly areas and highlands of Hercynian, landscapes of plains, landscapes of wide river floodplains and landscapes without differentiated reliefs = towns and cities), and *b)* contrasting relief (landscapes of highlands, landscapes of highly situated plateaus, karst landscapes, landscapes of distinct slopes and rocky mountain ridges, landscapes of kettles, landscapes of carved valleys and landscapes of piles and cones). Land use types were set according to the framework of landscape types and according to area exploitation (Löw and Novák, 2008) – agricultural, agro-forestry, forestry, pond, urbanized. Also, an assessment was made of the accommodation facility location within nature conservation and landscape protection areas, namely with regard to the fact that nature conservation acts as a decelerating element in the development of tourism (Vepřek, 2002) and, at the same time, as a basic natural and landscape attraction (Mariot, 1983). The observed categories were national parks, protected landscape areas and natural parks. Conformity of the model number of visitors in the respective categories of the four above-mentioned types with the expected number of visitors in these categories (which is given by the share of the given category in the total area of the studied territory and by the share of the model number of visitors of this category in the total model number of visitors in the studied territory) was tested by the chi-square goodness-of-fit test (Meloun and Militký, 2006). ANOVA and chi-square test were calculated using the STATISTICA 10 software package (StatSoft, 2011).

Considering the fact that the factors of environment used in the analysis are not supposed to be understood as independent variables (Griffith, 2009), it was necessary to evaluate the most important analyzed factors by means of multidimensional exploratory approaches. To determine the importance of respective variables in the context of all evaluated variables, principal component analysis (PCA) was used applying the programme CANOCO 4.5 (ter Braak and Šmilauer, 2002). The data were not transformed before the proper analysis. Connections between the accommodation facility type and environment factors were assessed by using redundancy analysis (RDA), applying the programme CANOCO 4.5 (ter Braak and Šmilauer, 2002) as well.

3. Results and Discussion

3.1 Impact of space on the location

The curves of location (= Lorenz curves) of the individual categories (hotel, guesthouse, camp and tourist hotels) are quite close to the diagonal and their Gini coefficients are relatively low too (Fig. 2). Both indicators depend on the size of spatial units used and it is true that the curve of location is, with the increasing spatial unit, closer to the even distribution represented by the diagonal in the graph and the Gini coefficients are lower as well. Despite that, the result testifies a relatively regular distribution of these types of accommodation facilities in the respective tourist zones or their parts, including some areas of the observed tourist regions South Bohemia and Šumava – in contrast to the observed distribution of hotels in urban structures (Bučeková, 2001; Bučeková, 2007). The expected regularity of distribution is impaired particularly in the case of resorts as shown by the course of the location curve as well as by the Gini coefficient value.

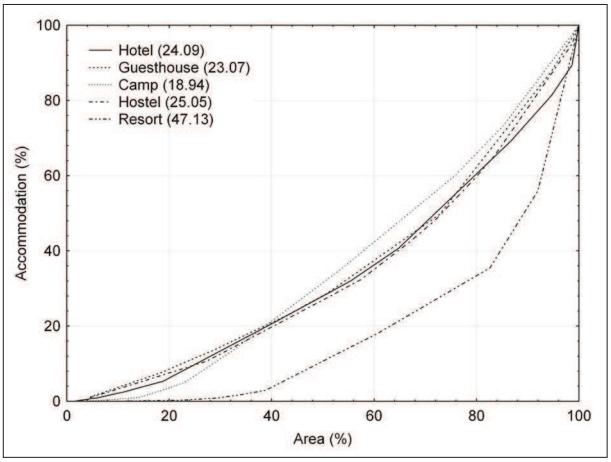

Fig. 2: Lorenz curves of accommodation facility types, Gini coefficients are presented in the upper left

	R-statistics	z scores
Hotel	0.347	– 21.721
Guesthouse	0.370	– 49.759
Camp	0.581	– 7.815
Hostel	0.477	– 10.203
Resort	0.638	– 5.272

Tab. 2: Results of the nearest-neighbour analysis with the values of R-statistics and z scores. All cases are significant at $p < 0.05$

Cluster structures in the distribution of all types of accommodation facilities (Tab. 2) were indentified through nearest-neighbour analysis of the first level. The most significant tendency to clustering was observed in hotels and guesthouses. These indications could show the stronger effect of agglomeration forces influencing these types of accommodation facilities (Kalnins and Chung, 2004). The weakest but still significant effect of these forces was proven in the case of resorts. Under the regime of the Czechoslovak Socialist Republic, these facilities were built up namely in the hinterlands of industrial agglomerations and under specific circumstances (Havrlant M., 1973; Havrlant J., 2003). This result was also proved by the analysis of spatial clustering. We succeeded in identifying an important number of 'hot spots' with a concentration of visitors. These specific locations are different for each of the types of accommodation facilities (Fig. 3). Points of the concentration of hotel visitors are above all in large towns of the region (České Budějovice, Tábor, Písek and Klatovy), in areas with unique cultural and historic monuments (Český Krumlov, Hluboká) and at places with a high spatial accumulation of tourism attractions (Třeboň – history and landscape, area of Železná Ruda/Markt Eisenstein – winter sports, area of Kvilda and Kašperk – winter sports and nature). A completely different structure is evinced, however, by the distribution of the second most important type

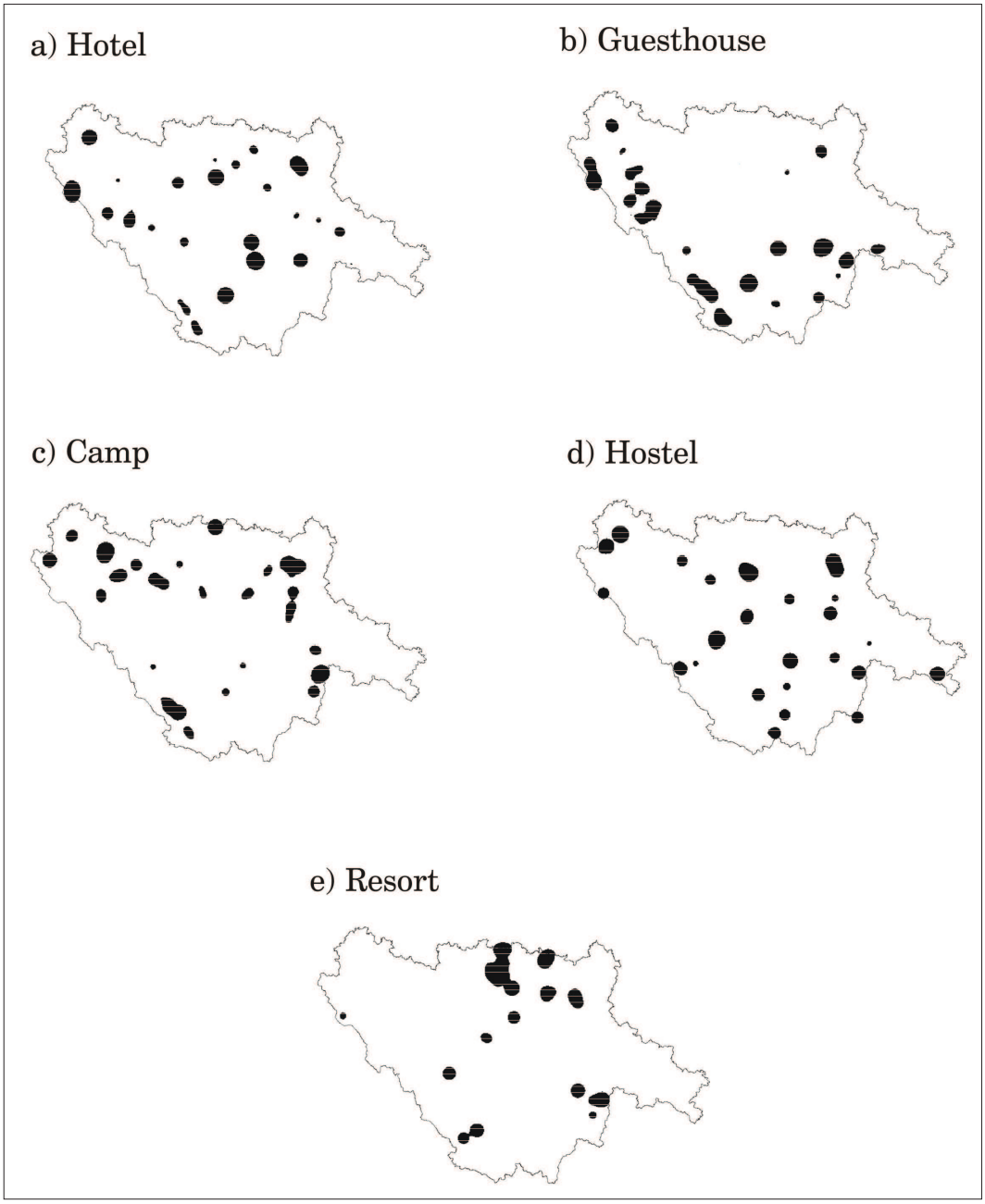

Fig. 3: High-density areas (> mean + 2 standard deviations) of each type of accommodation facility as identified by the case-side method of kernel estimation

of accommodation facilities – guesthouses. Points of their concentration are moved more significantly towards the areas of 'suitable' natural conditions (apart from České Budějovice and Český Krumlov). The centres are situated in two areas: Třeboň area plus the bordering Czech Canada and in the Lipno area plus all the western Šumava. The location of camps substantially differs from both previous location models. The camps are particularly linked to the presence of water surfaces in the landscape. Here we include namely the Lužnice and Otava Rivers used for water sports, water reservoirs such as Lipno, Orlík and the ponds Staňkovský and Hejtman in the Třeboň area. In the case of tourist hostels, the spatial links of their occurrence could not be identified due to the relatively low number of these facilities. We identified a lower number of resorts as well. Despite this fact, we can determine three basic areas of their presence in the observed area – it is particularly the Orlík water reservoir area. A higher concentration of resorts is also noticeable in the Třeboň area and on the lower reach of the Lužnice River.

3.2 Impact of the place on the location

The analysis of spatial clusters obviously shows that the location of individual types of accommodation facilities differs and that it is necessary to study them separately. In the majority of the potential factors of location of accommodation facilities, differences were found in the impact of these factors on the location of particular types of accommodation facilities.

Depending most on proximity to a cultural-historical attraction are hotels, then tourist hostels and guesthouses. On the other hand, statistically significantly different and less dependent on proximity to a cultural-historical attraction are camps and resorts (Fig. 4a). This fact could result from the diverse bid-rent functions (Aitchison et al., 2000) of the two types because resorts and camps need for their entrepreneurial activities substantially larger space and larger area surface than hotels (even the larger ones) and their clientele is usually one with lower expenditures during travelling. Therefore, these facilities provide usually lower standards of services. Considering the fact that the presence of an important monument increases the unit price of land in its surroundings, the camps and resorts are not able to outbid hotels. From this point of view, we can also see an interesting fact that hotels are significantly closer to particular attractions than are guesthouses. This fact could be influenced by the general character of attractiveness of the respective areas, where the accommodation facilities are situated as well as by

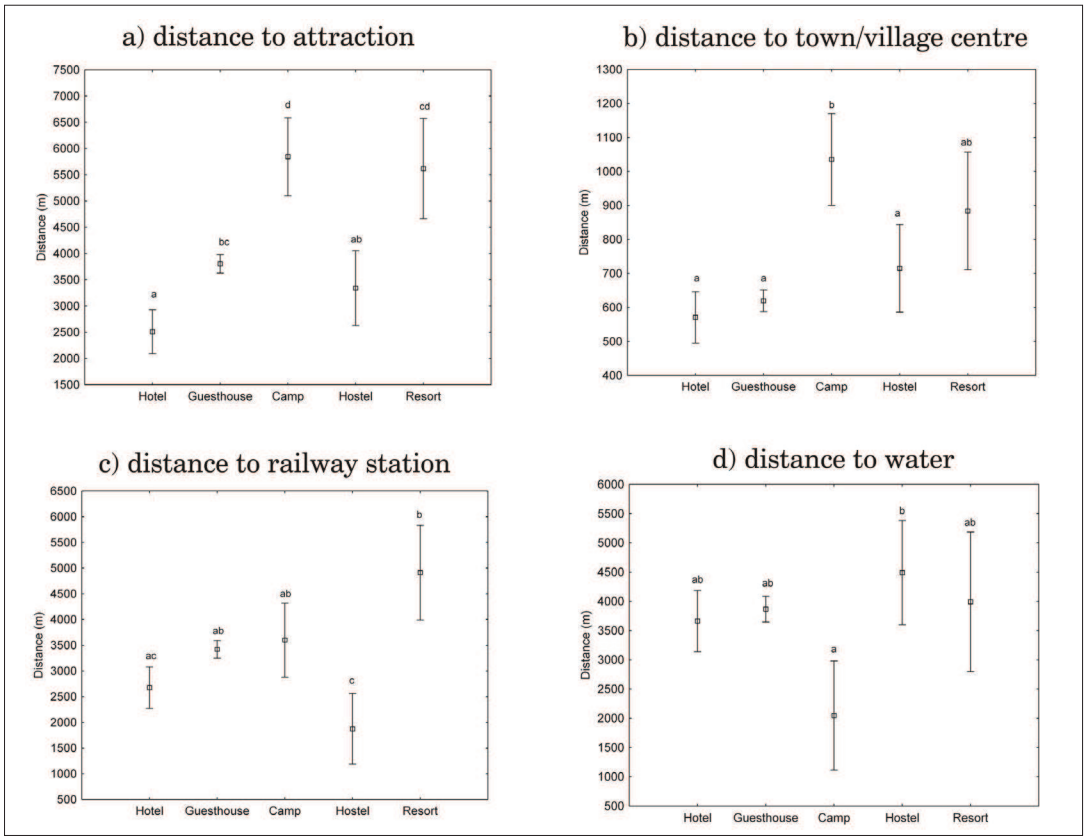

Fig. 4: Distances to selected factors of location for each accommodation type; plotted are mean values (vertical bars denote 0.95 confidence intervals); results of One-way ANOVA; means with the same letter do not differ significantly (Tukey HSD for unequal N test, p > 0.05, N = 2,259)

other localization factors that are important for guesthouses, but not for hotels (compare images ‚a' and ‚b' in Fig. 3). Similar, also, is the case of distance between the accommodation facilities and the centre of a town or village (Fig. 4b). As for the distance to cultural and historic attractions, guesthouses and hotels differ only in distance from the town centre.

The distance from the railway station was confirmed as a factor of location as well, but, moreover, as a factor that significantly differentiates the location of particular types of accommodation facilities (Fig. 4c). The closest average distance from the railway station was found in the case of tourist hostels; their location is significantly closer than that of guesthouses, camps and resorts. On the contrary, the highest distance was found in the case of resorts (significantly further than the cited hostels and even hotels). On the other hand, there were no differences identified in the proximity of the respective types of accommodation facilities to important roads.

With regard to the specific importance of water surfaces for tourism in the Czech Republic and especially for tourism in the studied regions, we also assessed the significance of the location distance from water (Fig. 4d) and identified the highest weight for camps, the distance of which differs significantly from more distant tourist hostels. This result could confirm the location of hostels in the urban area whereas the typical location of camps is in the rural environment, especially in proximity to water (compare Fig. 3c).

By means of the goodness-of-fit test we identified different models in location for all types of accommodation facilities based on a comparison of the model number of visitors and their expected number in different environments.

Climate belongs to the most important factors for the location of tourist activities (Mariot, 1983) and affects also the location of the individual types of accommodation facilities (Tab. 3). Hotels are importantly concentrated, compared to the even distribution, particularly in towns and cities (Goeldner and Ritchie, 2009) and furthermore, even in the coldest areas – mountain resorts. Guesthouses are, on the contrary, concentrated significantly only in colder areas. On the other hand, warm areas are characterized by a higher presence of hostels, resorts and also camps.

Other main preconditions for a tourist location are relief and rock environment (Miklós, 1978). This was found to be true as it was successfully confirmed for all observed types of accommodation facilities with the exception of tourist hostels (Tab. 4). All other types of accommodation facilities show a higher visit rate in landscapes of contrasting relief types than was expected. This is especially true for resorts whose attendance was twice as high as expected. In absolute numbers, the most important part of visit rate move towards the landscapes of contrasting relief types is generated by hotels (over 60 thousand), which is a very interesting finding with regard to the fact that hotels are primarily pulled into the urban structures (see above).

In the sense of the spatial pattern of land use, the landscape is considered a tourist attraction as well. Land use attractiveness as a self-standing category of attractiveness was demonstrated (as could have been expected based on above-mentioned results) namely in hotels located in towns, in which the number of guests was 10 times higher than expected by the model (Tab. 5). The importance of urbanization cores for the location of hotels was thus repeatedly confirmed (Bučeková, 2007), this time when comparing them

		Cold	Colder MW	Middle MW	Warmer MW	Chi-Square	d.f.	p
Hotel	observed	185,858.0	118,492.0	117,367.0	133,913.0	88,280.1	3	< 0.001
	expected	107,718.0	143,217.8	186,058.2	118,636.0			
Guest house	observed	68,963.0	54,232.0	132,987.0	105,185.0	27,640.5	3	< 0.001
	expected	70,056.9	93,145.1	121,007.3	77,157.7			
Camp	observed	8,007.0	12,583.0	13,720.0	4,288.0	18,96.4	3	< 0.001
	expected	7,482.9	9,948.9	12,924.9	8,241.3			
Hostel	observed	15,656.0	17,318.0	13,753.0	4,249.0	9,391.2	3	< 0.001
	expected	9,882.5	13,139.5	17,069.8	10,884.2			
Resort	observed	31,946.0	9,078.0	10,741.0	9,436.0	42,480.9	3	< 0.001
	expected	11,864.8	15,775.0	20,493.8	13,067.4			

Tab. 3: Measured and expected values of the model number of visitors in the respective types of accommodation facilities in the respective types of climate

		Ordinary	Contrasting	Chi-Square	d.f.	p
Hotel	observed	398,029.0	157,601.0	57,215.0	2	< 0.001
	expected	464,151.8	91,478.2			
Guest house	observed	263,028.0	98,339.0	30,359.4	2	< 0.001
	expected	301,872.0	59,495.0			
Camp	observed	31,738.0	6,860.0	48.1	2	< 0.001
	expected	32,243.3	6,354.7			
Hostel	observed	46,107.0	4,869.0	1,771.0	2	< 0.001
	expected	42,583.4	8,392.6			
Resort	observed	36,794.0	24,407.0	24,399.7	2	< 0.001
	expected	51,125.0	10,076.0			

Tab. 4: Measured and expected values of the model number of visitors in the respective types of accommodation facilities in respective types of relief

		Agricultural	Agro-forestry	Forestry	Urbanized	Pond	Chi-Square	d.f.	p
Hotel	observed	15,307.0	289,767.0	46,640.0	161,306.0	42,610.0	1,341,762.0	4	< 0.001
	expected	25,108.2	347,970.8	123,019.2	16,395.6	43,136.2			
Guest house	observed	10,662.0	228,015.0	31,001.0	30,320.0	61,369.0	107,793.9	4	< 0.001
	expected	16,329.7	226,11.0	80,008.4	10,663.3	28,054.6			
Camp	observed	3,283.0	19,661.0	4,523.0	1,920.0	9,211.0	17,516.8	4	< 0.001
	expected	1,744.2	24,172.5	8,545.8	1,139.0	2,996.6			
Hostel	observed	5,870.0	24,108.0	1,764.0	15,832.0	3,402.0	152,022.0	4	< 0.001
	expected	2,303.5	31,924.4	11,286.3	1,504.2	3,957.5			

Tab. 5: Measured and expected values of the model number of visitors in the respective types of accommodation facilities in the respective types of land use

with other types of accommodation, which is also the case of tourist hostels (ten times more clients than expected were accommodated in town hotels.). Likewise, the number of clients of guesthouses in towns is higher than expected (compared to hotels, however, significantly lower, only less than three times as much as expected). Compared to hotels, more than double the number of visitors than expected was discovered in pond landscapes. However, even more important is the pond landscape for camps – they have three times more clients than expected. Apart from the pond landscape and in contrast to the previous types of accommodation facilities, for camps it is also the rural landscape that plays a significant role since the amount of clients accommodated in the agricultural-forest landscape was almost twice than expected. Resorts primarily represent an out-of-the town type of accommodation as none of them was localized in an urban type of landscape, which among other things rendered invalid the implementation of the goodness-of-fit test and hence the assessment of the importance of landscape types for their location.

From the comparison of paradigmatic and expected visit rates in the individual types of accommodation facilities according to the type of conservation, we can see that natural parks do not belong to areas where accommodation facilities are located (Tab. 6). We found too that National parks represent areas, where the visit rate of all accommodation facilities is lower than it should be as related to their surface area (with the exception of guesthouses). This fact is due to restricted construction resulting from requirements for nature conservation and landscape protection.

Guesthouses usually do not have special requirements for their construction and are quite often indistinguishable from the residential function of a village or town (Bégin, 2000). Therefore, it is necessary to understand the existence of a national park as a decelerating factor of the development of tourism (Vepřek, 2002). On the other hand, visitors are significantly attracted by the protected landscape areas in which their attendance is higher than it should be compared to their size (with the exception of

		Without protection	National Park	Protecte Landscape Area	Natural Park	Chi-Square	d.f.	p
Hotel	observed	382,054.0	19,189.0	136,564.0	17,823.0	57,032.3	3	< 0.001
	expected	380,382.6	31,735.9	88,140.8	55,370.7			
Guest house	observed	170,828.0	25,763.0	130,539.0	34,237.0	118,563.0	3	< 0.001
	expected	247,390.8	20,640.2	57,324.4	36,011.6			
Camp	observed	25,218.0	598.0	10,923.0	1,859.0	6,015.8	3	< 0.001
	expected	26,424.0	2,204.6	6,122.9	3,846.4			
Hostel	observed	43,338.0	1,609.0	4,810.0	1,219.0	6,885.9	3	< 0.001
	expected	34,898.0	2,911.6	8,086.4	5,080.0			
Resort	observed	42,179.0	970.0	13,924.0	4,128.0	4,294.0	3	< 0.001
	expected	41,898.0	3,495.6	9,708.4	6,098.9			

Tab. 6: Measured and expected values of the model number of visitors in the respective types of accommodation facilities in large protected areas

tourist hostels) The number of accommodated clients is significantly higher than it corresponds to the surface of the protected landscape areas. That number seems to be fundamental for guesthouses (more than double) but also for hotels, camps and resorts, where it is by 50% higher than it should be. Tourist hostels are situated out of protected areas, which only confirms their location in the town centres.

The PCA results confirm interrelations of the observed factors of environment and the individual types of accommodation facilities. The first component axis separated locations distributed along the gradient of urban – natural environment (Fig. 5), i.e. locations situated in the national park with a cold climate, characterized by higher density of forests, presence of irregular relief types and difficult accessibility, from those locations situated in warm climate and in urban areas. The second component axis separated rural localities along the gradient of water – agricultural environment. This was differentiated namely by facilities situated in landscapes with water bodies, localized particularly in protected landscape areas. Based on the PCA we can conclude that in the observed area, there are three basic and diametrically different types of places with the location of accommodation facilities, i.e., towns, nature, and water. Based on the passively fitted types of accommodation facilities in the graph, we can hypothetically confirm the results of the density graphs of the spatial distribution of individual accommodation facilities – by their location, hotels and hostels gravitate to the urban environment, guesthouses and resorts incline to the natural environment, and camps to the water environment. This hypothesis was successfully confirmed by the direct ordination of RDA, as its both first and second axes are significant ($F = 17.540$, $p < 0.01$; resp. $F = 7.815$, $p < 0.01$). The explained variability is, however, not too

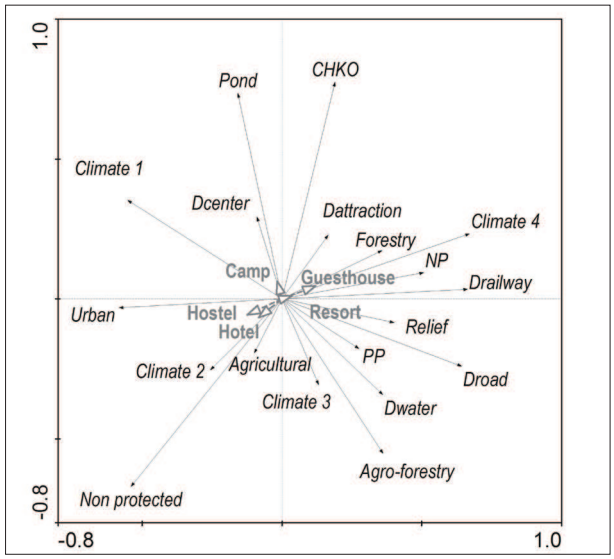

Fig. 5: 1st and 2nd axes of the PCA of the data of environment factors with passively projected types of accommodation facility (length of their arrows is independent on different numbers of types of accommodation facility in the database)
Dcenter = distance to city/town/village centre
Dattraction = distance to cultural/historic attraction
Droad = distance to road
Drailway = distance to railway station
Dwater = distance to water bodies in recreational use
Relief = contrasting relief
Urban = urbanized type of landscape
Pond = pond type of landscape
Agricultural = agricultural type of landscape
Agro-forestry = agro-forestry type of landscape
Forestry = forest type of landscape
NP = location within National Park
CHKO = location within Protected Landscape Area
PP = location within Natural Park
Non-protected = location out of any protected area
Climate1 = warmer MW
Climate2 = middle MW
Climate3 = colder MW
Climate4 = cold

high (1.1%), although this is not surprising. All types of accommodation facilities are localized in almost all types of the studied variables of the environment. We have after all succeeded in demonstrating statistically significantly different models of location factors for the individual types of accommodation facilities (relative in relation to other types of accommodation facilities). For the hotels, the most important criterion of location is the urban area. For the guesthouses, it is the natural environment of cold climate with a dynamic relief and location within a national park. For the camps and for the resorts, too, it is a long distance from the centres of towns and villages, as well as from cultural and historic attractions, and for the hostels, it is the location in areas outside the protected areas (Fig. 6).

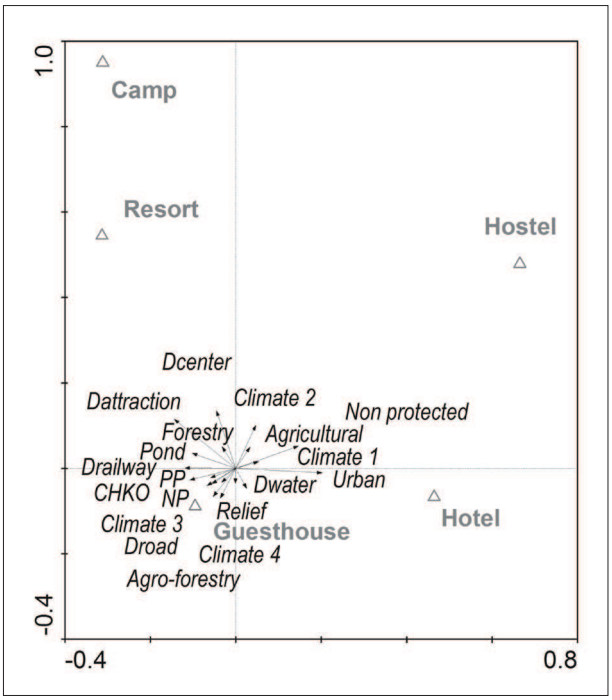

Fig. 6: 1st and 2nd canonical axes of redundancy analysis For legend see Fig. 5

4. Conclusions

We tried to assess the impact of a broad number of geographic factors in the location of accommodation facilities in two tourist regions of the Czech Republic: South Bohemia and Šumava Mts. The information on location, size and type of accommodation facility was obtained from documents published on the Internet. The data source basis created in this way allowed us to geocode the location of 2,259 accommodation facilities and to enlarge our knowledge of the spatial organization of accommodation capacities of the material-technical basis of tourism, the analysis of which normally uses the visit rate statistics of mass accommodation facilities in municipalities or in higher territorially administrative units from the database of the Czech Statistical Office or from the 'census of people, houses and flats'. Regarding the fact that our database is geocoded to addresses according to the descriptive number and comprises even individual holiday homes, this database allowed us to assess the spatial structure of tourist facilities in a way that is impossible using conventional and generally accessible sources of information.

Based on our analysis, we conclude that the impact of the majority of geographical location factors for accommodation facilities cited in the research literature was confirmed. However, the location of the individual types of accommodation facilities significantly differs and each type of accommodation facility can be characterized by the following average effects of location:

- hotels participate most importantly in the number of accommodated people in the observed regions; they show an important tendency to create spatial clusters and these clusters are situated mainly in urbanized areas. Besides the large towns and cities, hotels are typically located in the proximity of unique cultural and historic attractions, as well as mountain resorts for winter sports;
- guesthouses constitute the second most important part in the total number of accommodated clients and are concentrated in urban areas, too, but not as strictly as hotels, as the core of their occurrence moves towards special rural structures – to colder higher altitudes and to pond areas. They are also the only accommodation type more expanded (than expected) directly in the Šumava National park;
- camps have found the focal point of their presence decidedly out of urban areas; they are situated namely near water courses and water surfaces, especially in warmer areas;
- tourist hostels are strictly related to towns and an important location factor for them is the accessibility of public transport; and
- resorts are localized particularly in several specific areas in the observed regions and strictly out of the urban environment, namely near water in warmer areas.

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