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From core protection to compromise: A critical assessment of zonation in the Tatra National Park (TANAP) and Low Tatras National Park (NAPANT), Slovakia

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Abstract. Zonation is a fundamental conservation tool that determines whether national parks effectively protect biodiversity, ecological processes, and ecosystem services, or gradually erode them. This paper critically evaluates the current zonation proposals for the Tatra National Park (TANAP) and the Low Tatras National Park (NAPANT), which together encompass the two largest mountain ranges of the Western Carpathians. Although zonation is formally embedded in Slovak legislation, its consequences extend far beyond national borders, directly affecting transboundary ecological connectivity, regional water resources, and ecosystem stability in Central Europe. Our analysis shows that the proposed zonation lacks a solid scientific foundation and fails to establish spatially coherent and functionally connected core areas (Zone A). Key alpine habitats of endemic and threatened species – most notably the Tatra marmot (*Marmota marmota latirostris*) and the Tatra chamois (*Rupicapra rupicapra tatrica*) – remain insufficiently protected, as do extensive forest habitats of the western capercaillie (*Tetrao urogallus*), a protected umbrella species. Old-growth forests, primeval forests, and their remnants, which are essential for maintaining natural ecological processes, hydrological regulation, erosion control, climate resilience, and long-term forest stability, are systematically excluded from strict protection. Beyond the expansion of ski resorts, zonation is increasingly shaped by growing pressure for timber extraction and commercial wood sales, affecting not only communal land holdings but also state-owned forests. Private ownership interests often dominate zoning negotiations, while the long-term public value of intact forests, particularly for drinking water security, flood mitigation, and ecosystem resilience under climate change, is marginalised. Incomplete biodiversity data, limited integration of contemporary scientific knowledge, and the prioritisation of short-term economic interests have transformed zonation from a science-based conservation instrument into an administrative compromise. Given the ecological importance of the Western Carpathians, the current zonation of TANAP and NAPANT represents a transnational conservation risk and underscores the urgent need for a process-oriented, connectivity-based approach to core area protection.

Key words: national park zoning, ecological connectivity, old-growth forests, umbrella species, alpine ecosystems, Western Carpathians

Introduction

This article presents an independent expert assessment of the currently proposed zoning of the Tatra National Park (TANAP) and the Low Tatras National Park (NAPANT), prepared by research and academic staff of the Institute of High Mountain Biology of the University of Žilina (IHMB UŽ). Our engagement in this process is grounded in long-standing professional responsibility, scientific expertise, and theoretical knowledge related to nature conservation, ecological processes, and the relevant legislative framework.

IHMB UŽ is a unique research institution as the only workplace in Slovakia permanently based in a high-mountain environment, conducting long-term and systematic ecological field research directly within national park territories. Many of the areas affected by the proposed zoning also constitute the core of our long-term research sites, where we monitor ecological relationships, habitats, and populations of protected species over time periods sufficient to identify trends and changes in mountain ecosystems. The Institute is also actively involved in higher education and professional training in nature conservation, including the preparation of future national park rangers and other specialists who will be responsible for implementing conservation measures in practice. This educational role provides valuable insight into how zoning decisions and protection regimes translate into day-to-day conservation practice and into the expectations placed on professional staff working in the field.

We regard zoning primarily as a science-based process that should be founded on current ecological

knowledge, functional landscape connectivity, and the protection of natural processes. The Institute has addressed zoning issues in a systematic and sustained manner, as documented by earlier professional outputs, including analytical and synthetic works in which zoning represented one of the key thematic areas (Janiga *et al.* 2025). This article therefore constitutes an autonomous, peer-review-style scientific statement reflecting the perspective of IHMB UŽ researchers on the current zoning proposals for TANAP and NAPANT, formulated in the interest of evidence-based nature conservation, the preservation of ecological processes, and the long-term stability of mountain ecosystems.

Zuzana Kompišová Ballová

Critical commentary, fundamental comments, and requests for change

NAPANT – Exclusion of habitats of endemic and threatened species of European importance from Zone A of the Low Tatras National Park (NAPANT): the Tatra marmot (Marmota marmota latirostris) and the Tatra chamois (Rupicapra rupicapra tatrica)

The failure to designate alpine-belt habitats as part of the strictest protection zone constitutes a fundamental weakness of the proposed zoning of the Low Tatras National Park (NAPANT). These areas are critically important for the persistence and long-term stability of the isolated populations of the Tatra marmot and the Tatra chamois, i.e. endemic and threatened taxa of European importance. Both taxa are characterized by limited dispersal opportunities, high sensitivity to environmental change, and well-defined ecological requirements, which makes them particularly vulnerable to anthropogenic pressures. Their conservation therefore entails binding obligations for the Slovak Republic under national legislation as well as under European Union nature conservation directives.

Long-term monitoring of the Tatra marmot indicates that the most suitable habitats for this taxon are located in the alpine belt of the Low Tatras, notably in the area from Bory and Sedlo Poľany across Dereše and Chopok, further across the continuous alpine belt between Chopok and the Ďumbier massif (Ballo 2025), and in the Kráľova hoľa area. These sites represent core habitats that provide conditions for reproduction, burrow construction, and foraging, and they are essential for the spatial stability of the population. Analogously, these areas are also important for the Tatra chamois, whose life cycle is tightly linked to undisturbed alpine and subalpine habitats. Excluding the above habitats from Zone A risks weakening the protection regime precisely in areas that should form the core of non-intervention protection within the national park. In the absence of clearly defined restrictions, these habitats are exposed to increased disturbance due to intensive tourism, habitat fragmentation, changes in vegetation structure, and other anthropogenic influences. Such pressures can reduce reproductive success and progressively destabilize both endemic populations. From the perspective of conservation objectives and the fulfilment of national and international obligations, it is therefore essential that key alpine-belt habitats in NAPANT are included within the strictest protection zones.

NAPANT – Need to revise zoning to ensure functional connectivity of Zone A across the national park

A major deficiency of the proposed NAPANT zoning is the fragmentation of Zone A and the absence of its functional connectivity across the national park. Zone A should form a coherent protection system and include the entire alpine belt (with the exception of existing infrastructure and buildings), as well as all forest habitats comprising old-growth forests, primeval forests and their remnants, and key habitats of the western capercaillie (*Tetrao urogallus*). Such delineation is consistent with Act No. 543/2002 Coll., which stipulates that the objective of a national park is to secure the conservation or gradual restoration of natural ecosystems and the undisturbed course of natural processes on at least three quarters of the national park's area (§ 19(2)). If Zone A is fragmented into small, isolated "islands" in the alpine belt and is practically absent in the forest belt, this objective cannot be achieved, because small isolated patches cannot fulfil the function of a national park's core area. The Act further requires that zones should generally be delineated as contiguous parts of the protected area (§ 30(2)), which is not met by the current proposal in the Low Tatras, whereas continuous valley units with naturally regenerating forests would satisfy this requirement. Under § 30(4)(a), Zone A should be established mainly in areas dominated by natural or only slightly human-modified ecosystems and should cover at least half of the national park; forest complexes undergoing natural regeneration after disturbance (e.g. Vajskovská, Ďumbierska or Jánska Valley) meet these criteria, and their placement in lower-protection zones is inconsistent with the definition of Zone A. Moreover, nature protection legislation emphasizes the conservation of ecosystem services (§ 1; § 2(zf) and (zh)), which are best secured by extensive and continuous valley complexes rather than by isolated alpine "islands". The inclusion of old-growth forests within Zone A is also aligned with the National Biodiversity Strategy of the Slovak Republic (2023–2030), which identifies old-growth forests as a priority due to their irreplaceable ecological value, and with the capercaillie Recovery Programme in Slovakia (MoE SR, 2018), which identifies habitat fragmentation and loss as principal drivers of population decline. In a broader international context, a connected Zone A corresponds to IUCN Category II (National Park), which presumes core areas composed of compact blocks of natural ecosystems, and it supports obligations under the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC), as Low Tatras valleys contain habitats of European importance and the capercaillie is a species requiring special area-based protection. The proposed expansion and functional connectivity of Zone A is also fully consistent with the objectives of the Convention on Biological Diversity (CBD), which commits Parties to ensure effective protection of

at least 30% of terrestrial and inland water areas by 2030 through well-managed and ecologically functional protected areas and other effective area-based conservation measures.

NAPANT – Response of the NAPANT Administration and counter-arguments to the above major comments

In its response to comments, the NAPANT Administration states that the provisions of § 30(4)(a) and (b) of Act No. 543/2002 Coll. are recommendatory rather than strictly binding, and that the zoning proposal was prepared in accordance with Slovak and EU legislation as well as the current distribution of protected features (protected species and habitats). It further argues that ensuring the undisturbed course of natural processes across a decisive portion of the national park is currently, and within a time horizon of several decades, realistically unattainable and should therefore be understood as a long-term vision whose implementation will gradually evolve in space and time. In this context, the Administration notes that, under a strictly "absolutist" legal interpretation, the zoning process may appear inconsistent with § 19(2), whereas under a "relativist" interpretation the inconsistency disappears; it similarly notes that IUCN documentation is recommendatory. The Administration also claims that it does not see room for establishing Zone A in certain areas without landowner consent; questions the appropriateness of passive management for selected alpine and subalpine plant species; and considers the inclusion of capercaillie habitats in Zone A under passive management potentially inconsistent with the approved capercaillie recovery programme for 2025–2029. Finally, it challenges the occurrence and extent of primeval forests, remnants, and old-growth stands, arguing that this is based on subjective perceptions not supported by expert justification or independent review.

In response, it should be noted that although the Act uses formulations such as "generally" or "mainly", these do not amount to non-binding recommendations; rather, they express the legislator's normative intent and define the expected conservation standard for a national park. Systematically weakening these provisions through a relativist interpretation effectively weakens the normative content of the concept of a national park as an area where the priority is the protection of natural processes. The argument that the statutory objective is unattainable in "real time" also conflates the target state with the instrument for achieving it: zoning should not merely describe the current compromise, but should establish the spatial framework enabling progressive fulfilment of conservation objectives. With respect to property rights, nature conservation law provides tools for restricting certain uses in the public interest; the absence of landowner consent cannot therefore serve as an ecological criterion for delineating functionally effective core zones. Regarding the capercaillie, recovery programmes are adaptive instruments tied to a specific period, whereas zoning is inherently long-term; keeping core habitats outside Zone A due to a hypothetical future need for active intervention undermines the spatial stability of species protection. Finally, the presence of old-growth forests and primeval forest remnants in the Low Tatras cannot be reduced to subjective perception, as their identification typically rests on multiple lines of evidence, including historical cartographic sources, stand structural attributes, and available expert datasets; the lack of unified assessment indicates a need to consolidate and standardize classification, rather than a legitimate reason to exclude these stands from the core zones of protection.

Reclassification of ski pistes and cableways into Zone D

The NAPANT Administration has placed ski pistes and cableways within Zone D irrespective of the occurrence of endemic and threatened species, particularly the Tatra marmot and the Tatra chamois, even though in the alpine and subalpine belts of NAPANT these are key occurrence areas. Importantly, the Tatra marmot has been shown to be a keystone species acting as an ecosystem engineer of alpine meadows (Ballová *et al.* 2019). Through intensive digging activity, marmots aerate the soil, transport nutrients from deeper layers to the surface horizon, and alter soil chemical properties, thereby creating conditions for the persistence of plant species that might not otherwise survive under local conditions. Burrow spoil mounds also form ecological "islands" that provide specific microhabitats for various groups of plants and animals and increase the biodiversity of alpine meadows. The loss or exclusion of such a keystone species can trigger cascading changes with consequences for the entire ecosystem (Beschta and Ripple 2016).

At present, colonies of the Tatra marmot in the Chopok area occur directly on ski pistes and in the immediate vicinity of cableway infrastructure (Ballo 2025). Intensive disturbance has demonstrable effects on their activity patterns and physiological processes (e.g. Novacký 1978, 1981), and the mere presence of mass tourism and ski infrastructure within their natural habitats has already led to the displacement of colonies from long-occupied sites to less suitable, suboptimal habitats. A further reduction in the level of protection by assigning these areas to Zone D may therefore amplify negative pressures that are not sufficiently addressed by existing legislation, including interventions associated with snow conservation and snowpack modification.

On ski pistes and sports tracks, both chemical and non-chemical methods are used to conserve and modify snow, with the aim of prolonging snow cover and improving its mechanical properties. Chemical approaches primarily include salting and the application of so-called snow hardeners, whereas non-chemical methods include artificial snow production, mechanical grooming/compaction, snow farming, insulating covers, and terrain/piste surface modification. Chemical snow hardening is used mainly on racing courses. Sodium chloride (NaCl) alters bonding between snow grains and increases the hardness of compacted snow (Wåhlin *et al.* 2014). In addition to NaCl, urea, nitrate salts, and potassium formate have also been used, showing comparable hardening effects but

with different chemical consequences (Wåhlin and Klein-Paste 2015). A distinct group comprises biological additives for artificial snow based on the ice-nucleating proteins of *Pseudomonas syringae* (e.g. Snomax®), which can facilitate snow production at higher temperatures but remain subject to environmental and regulatory debate (Rixen *et al.* 2003; Baloh *et al.* 2019).

Among non-chemical methods, additive-free artificial snow production generates denser snow that persists longer on pistes, particularly when combined with mechanical grooming/compaction (Keller *et al.* 2004; Rixen *et al.* 2004). An important innovation is snow farming, in which snow is stored over summer in insulated stockpiles (Grünewald *et al.* 2018). A related approach is insulating snow or ice using geotextile covers to reduce melt rates. Environmental impacts vary substantially among methods. Chloride salts pose a risk of increased chloride inputs to soils and surface waters, potentially causing salinization and reducing the diversity of aquatic invertebrates (Szklarek *et al.* 2022; Haake *et al.* 2022). In soils, chloride may negatively affect plant growth and soil chemistry (Rixen *et al.* 2003). Urea and nitrate salts represent significant inputs of reactive nitrogen, which can increase nitrogen mineralization, exert fertilization effects, and shift plant community composition; nitrogen may also be leached to surface waters during snowmelt (Rixen *et al.* 2003; Rixen *et al.* 2008).

For biological additives, key environmental concerns relate to the transport of ice-nucleating particles within the water cycle of ski resorts and their potential interactions with natural microbial communities, as well as possible health risks associated with handling these products (Baloh *et al.* 2019; Lagriffoul *et al.* 2010). In protected areas, artificial snow production, particularly when biological additives are used, may therefore act as a vector of biological contamination and an intervention into natural processes, the long-term ecological consequences of which remain insufficiently understood (Baloh *et al.* 2019). Artificial snow production and grooming without chemical additives substantially modify the physical properties of the snowpack, leading to shifts in soil temperature regimes, delayed snowmelt, and a later onset of the growing season (Keller *et al.* 2004; Rixen *et al.* 2004). Over the long term, these changes manifest as reduced plant species diversity on ski pistes (Wipf *et al.* 2005) and may be accompanied by hydrological impacts related to water abstraction and the operation of mountain water reservoirs for artificial snow production (Evette *et al.* 2011; Lenart-Boroń *et al.* 2023). Although snow farming can reduce the need for repeated snow production, its local environmental effects may be substantial: long-term snow cover can cause high vegetation mortality, and after removal it can induce strong pulses of inorganic nitrogen into soils, markedly affecting subsequent plant succession (Buttler *et al.* 2023). Overall, the cumulative environmental impacts of snow conservation and modification methods, especially chloride and nitrogen inputs, changes in soil processes, hydrological regimes, and biodiversity, require rigorous assessment and precautionary management, particularly in sensitive mountain and protected areas.

Response of the NAPANT Administration and counter-arguments

In response to this comment, the NAPANT Administration states that the inclusion of ski pistes and cableways in Zone D is based on the fact that these are existing structures with legally valid permits, which are classified under the Building Act as engineering structures, i.e. areas substantially modified by human activity or effectively denaturalised. According to this position, retaining these facilities in Zone C would not result in the removal of physical obstacles in the terrain nor in a reduction of mortality of protected species, and would therefore bring no tangible ecological benefit. After considering the degree of disturbance, the spatial extent of land take, and the level of denaturalisation, the NAPANT Administration maintains that keeping ski pistes and cableways within Zone D represents an appropriate solution within the proposed zoning scheme.

However, the argument that ski pistes and cableways must remain in Zone D solely because they are existing structures with valid permits fails to reflect the fundamental purpose of zoning as a nature conservation instrument. Zoning is not intended to retrospectively "legalise" existing interventions, but to establish an appropriate protection and management regime for the future. The existence of legally permitted structures does not preclude either the surrounding land or the structures themselves from being included in higher protection zones with clearly defined restrictions on operation, seasonality, and management, which is a common practice in national parks abroad.

The classification of ski pistes as "engineering structures" under the Building Act cannot automatically take precedence over nature conservation objectives. The Nature and Landscape Protection Act constitutes lex specialis in areas subject to a special protection regime. The mere presence of infrastructure does not eliminate the ecological function of an area or the occurrence of protected species. The documented presence of marmot burrows beneath cableways and on ski pistes, and the regular use of these areas as grazing grounds by chamois, clearly demonstrates that these sites are not biologically "dead" or irreversibly de-naturalised areas, but functional habitats of protected species that require an enhanced level of protection. The claim that placing ski pistes in Zone C would not in itself remove terrain obstacles or immediately reduce mortality of protected species is misleading from a conservation perspective. The purpose of a higher protection zone is not the retroactive removal of existing structures, but the creation of a legal framework that enables the effective implementation of mitigation measures, such as seasonal restrictions on operation, adjustments to cableway operating regimes, shutdowns during foggy conditions, limitations on night operation, technical modifications of cable lines, and off-season management of ski pistes. It is precisely in Zone D that the NAPANT Administration has the weakest capacity to effectively enforce such measures.

Maintaining ski pistes and cableways in Zone D on the basis of their level of "de-naturalisation"

establishes a problematic precedent, whereby the more degraded an area is, the lower the level of protection it is assigned. Such an approach is fundamentally at odds with the principle of ecosystem restoration and with the objectives of national parks, which should aim at improving the state of nature rather than freezing it at the lowest level of protection. The inclusion of ski infrastructure in a higher protection zone does not imply the automatic removal of existing structures, but rather strengthens the regulatory authority of the protected area administration.

Finally, the assertion that, after "considering the representation of conservation features, the extent of land take, and the level of de-naturalisation", retention in Zone D is the only viable option is not supported by a transparent assessment methodology. In the absence of clearly defined criteria, comparable data, and publicly available expert justification, this position represents an administrative decision rather than an ecologically substantiated conclusion. Given the documented occurrence of protected species and their habitats on ski pistes and beneath cableways, at least the reclassification of these areas into Zone C is warranted, as this would enable more effective nature protection without denying the existence of the infrastructure.

NAPANT – conclusion

The proposed zoning of NAPANT, in its current form, fails to establish a coherent and functionally connected core (Zone A) and leaves key alpine habitats of endemic and threatened species, most notably the Tatra marmot and the Tatra chamois, outside the highest level of protection. This weakens the National Park's ability to ensure the undisturbed functioning of natural processes, as required by §19(2), and contradicts the requirement that zones be delineated as spatially continuous units under §30(2) of Act No. 543/2002 Coll. The arguments put forward by the NAPANT Administration, based on a "relativistic" interpretation of statutory provisions and on conditioning Zone A on landowner consent, effectively shift zoning from a science-based conservation tool to an administrative compromise that does not reflect the ecological logic of core areas or the conservation needs of species of European importance. At the same time, reclassifying ski slopes and cableways into Zone D reduces the management authority's capacity to regulate activities in areas where protected species demonstrably occur and increases the risk of cumulative impacts (disturbance, slope management, technical interventions) in highly sensitive alpine habitats.

In practice, the continued expansion of the Jasná ski resort and the prioritisation of landowner and stakeholder interests prevail over the protective and ecological functions of forest and alpine ecosystems, while valuable drinking water resources are increasingly diverted for tourism and wellness facilities, simultaneously exposed to pollution from wastewater discharges, transport emissions, and runoff from roads and ski infrastructure; yet these areas are proposed to remain under low protection levels where the application of chemical substances is permitted, despite documented risks to groundwater, karst systems, caves, and subterranean waters, and in the absence of any comprehensive assessment of the cumulative impacts of this expansion under ongoing climate change—raising the fundamental question of whether long-term water security and ecosystem stability are ultimately less important for the region than short-term economic gains from tourism.

TANAP – Failure to include capercaillie habitats in Zone A of the national park

We consider it a fundamental problem that selected parcels (or parts thereof) identified as existing habitats of the capercaillie in the approved Programme for the Conservation of the Capercaillie for 2025–2029 (Ministry of the Environment of the Slovak Republic – MŽP SR, 2025), in particular parcels in the cadastral area of Bobrovec and parcels in the cadastral area of Jalovec (including the Jalovecká and Bobrovecká valleys and the Parichvost valley), have not been included in Zone A of the national park, despite the fact that the Programme envisages a regime with minimisation of disturbing interventions (passive management) for these areas.

Such areas meet the legislative logic of core protection zones in a national park: the objective of a national park is to ensure the undisturbed course of natural processes over a decisive part of its territory (§ 19(2) of Act No. 543/2002 Coll.), and zoning is the instrument for achieving this objective (§ 30). At the same time, the Act assumes that zones should, as a rule, be delineated as coherent parts of the protected area according to natural values and the degree of intervention (§ 30(2)). For key habitats of an umbrella species such as the capercaillie, this necessarily requires a spatially continuous and regime-stable core of protection.

International obligations further impose a specific duty to prevent the deterioration of habitats and to ensure a favourable conservation status of species and habitats of European importance (in particular within Natura 2000 sites; Habitats Directive 92/43/EEC, Article 6, and Birds Directive 2009/147/EC). The importance of these obligations for the protection of the capercaillie and its habitats is underscored by the case law of the Court of Justice of the European Union (e.g. Case C-661/20, Commission v. Slovakia), which criticised the Slovak Republic for insufficient prevention of habitat deterioration and weak practical protection of the capercaillie.

We therefore propose that all parcels, or their relevant parts, identified in the Programme for the Conservation of the Capercaillie *(Tetrao urogallus)* for 2025–2029 as existing habitats of this species be included in Zone A of Tatra National Park. At the same time, it is essential to ensure the spatial continuity of these core habitat areas so that they do not form isolated "islands" but rather functional and interconnected units, in line with the requirement of § 30(2) of Act No. 543/2002 Coll., according to which zones should be delineated, as a rule, as coherent parts of the protected area.

Response of the TANAP Administration and counter-arguments

In its response, the TANAP Administration states that all forest stands designated for passive management in the Programme for the Conservation of the Capercaillie were included in Zone A within the zoning, with the exception of lands owned by the Bobrovec common property association (landowner association), and that selected localities from the expert proposal with passive management were also included in Zone A, while other localities were incorporated into Zones B and C.

However, this assertion does not correspond either to the conservation objectives for the capercaillie or to the objectives of national park zoning, for the following reasons:
First, the Programme for the Conservation of the Capercaillie for 2025–2029 identifies specific areas as existing habitats of the species for which passive management is envisaged precisely because of their high sensitivity to disturbance. The designation of passive management implicitly entails the need for the highest level of spatial protection, i.e. inclusion in Zone A. Assigning parts of these localities to Zones B or C contradicts the internal logic of the Programme, since these zones allow interventions and activities that are incompatible with passive management.

Second, an exemption based on land ownership (the Bobrovec common property association) has no basis in Act No. 543/2002 Coll. Under § 30(2), zoning is to be determined on the basis of natural values and the degree of intervention, not on land ownership. If the TANAP Administration accepts ownership as a reason for excluding capercaillie habitats from Zone A, this constitutes an impermissible prioritisation of property relations over the protection of the conservation object, contrary to the very purpose of a national park.

Third, the claim that "selected localities from the expert proposal were included in Zone A" is inadequate from the perspective of protecting an umbrella species. Effective protection of the capercaillie requires a spatially continuous and functional core of habitats, not a selective inclusion of individual patches. Fragmenting habitats into parts assigned to Zones A, B, and C increases disturbance, disrupts functional links between lekking sites, feeding areas, and refuges, and is contrary to § 30(2) of the Act, which requires zones to be delineated, as a rule, as coherent territorial units.

Such an approach is also inconsistent with the international obligations of the Slovak Republic, in particular Article 6 of Directive 92/43/EEC and Directive 2009/147/EC, which require the prevention of deterioration of habitats of species of European importance. The case law of the Court of Justice of the European Union (Case C-661/20, Commission v. Slovakia) explicitly states that formal declarations of protection without effective spatial and management measures are insufficient. For these reasons, the inclusion of parts of capercaillie habitats in Zones B and C cannot be regarded as consistent either with the Conservation Programme or with the objectives of national park zoning. The proposed approach leads to fragmentation of protection and weakens the regime of passive management that is crucial for the survival and stability of the capercaillie population.

TANAP – Failure to include old-growth, natural forests and primeval forests in Zone A

We consider it a serious shortcoming that extensive areas of old-growth and natural forests, as well as parts of primeval forests, remain outside Zone A, despite being identified on the basis of expert data and analyses by the civic association Prales (NGO). According to these analyses, approximately 2,258 ha of old-growth and natural forests were excluded from the proposed Zone A, with the largest continuous complexes located in the Jalovecká, Bobrovecká and Parichvost valleys. In addition, parts of primeval forests in Pavlová, Spálená, Baranec, Kamenistá dolina, Osobitá and Trstený žľab, covering a total area of approximately 7.4 ha, also remained outside Zone A.

These forest stands represent ecosystems with exceptionally high ecological stability and play a key role in biodiversity conservation, water regulation, and long-term ecosystem services. From a legal perspective, they clearly fall within the category of areas for which Zone A is intended "in particular", i.e., areas dominated by natural or only minimally altered ecosystems, where the primary objective is to allow the undisturbed course of natural processes (§ 30(4)(a) of Act No. 543/2002 Coll.). The international dimension of this obligation is reinforced by the Carpathian Convention and its Protocol on Sustainable Forest Management (Notification No. 111/2006), which explicitly strengthens the commitment to protecting natural forest ecosystems throughout the Carpathians. We therefore propose that all identified old-growth and natural forests, as well as entire primeval forest complexes including their currently excluded parts, be included in Zone A of the national park and managed under a strict non-intervention regime, in line with § 30(4)(a) of Act No. 543/2002 Coll. The zoning process must also include a uniform methodological definition of old-growth and primeval forests, with clearly defined identification criteria, corresponding spatial data layers, and mechanisms of expert verification, in order to ensure transparency, consistency, and scientific credibility.

Response of the TANAP Administration and counter-arguments

In its response, the TANAP Administration states that, following an update of the underlying data, it included all primeval forests, primeval forest remnants, as well as old-growth and natural forests in Zone A, with the exception of land owned by the Bobrovec common-property association, and on this basis classified the comment as accepted. However, this assessment cannot be regarded as substantively or legally sound. The very existence of an exception based on land ownership demonstrates that the comment was not accepted in full. Labeling the comment as "accepted" is therefore misleading, since a substantial part of the identified old-growth and natural forests remains outside

Zone A. Act No. 543/2002 Coll. does not allow the inclusion of land in Zone A to be determined by ownership structure, but exclusively by the character of ecosystems and the degree of their naturalness (§ 30(4)(a)). At the same time, the Act explicitly requires landowners to tolerate restrictions arising from nature conservation, while economic impacts are addressed through compensation for limitations on ordinary land use under § 61. Land ownership therefore cannot constitute a legitimate reason for excluding ecologically valuable forests from the core zone of a national park. Such an approach creates a dangerous precedent whereby the protection regime of the most valuable ecosystems could be systematically weakened whenever they occur on private or communal land. This directly contradicts the very essence of a national park as an area of overriding public interest, where nature conservation must take precedence over individual property interests. Moreover, the declaration that "all primeval forests and primeval forest remnants" have been included in Zone A cannot be independently verified in the absence of a transparent and uniform methodological framework. Without clearly defined criteria and an expert-reviewable process, the resulting zoning remains opaque and subjective.

The selective exclusion of parts of old-growth and natural forests also undermines the spatial integrity of core conservation areas. Old-growth and primeval forests function as ecologically interconnected complexes with a crucial role in maintaining biodiversity, hydrological stability, and carbon cycling. Their fragmentation is incompatible with the explicit objective of Zone A, namely to ensure the undisturbed operation of natural processes (§ 30(4)(a)). Finally, the approach adopted by the TANAP Administration is inconsistent with Slovakia's international obligations under the Carpathian Convention and its Protocol on Sustainable Forest Management (Notification No. 111/2006), which emphasise the preservation of natural forest ecosystems as a cornerstone of Carpathian conservation. Ownership-based exemptions weaken and relativise these commitments. For these reasons, the comment cannot be considered fully accepted. Achieving the actual objectives of zoning requires the inclusion of all identified old-growth and natural forests and entire primeval forest complexes in Zone A, without ownership-based exceptions, accompanied by a unified methodological framework for their identification. Only such an approach can ensure legal certainty, scientific defensibility, and the effective protection of the most valuable forest ecosystems within the national park.

Exclusion of alpine habitats of endemic and endangered species of European importance from Zone A: the Tatra marmot and the Tatra chamois

The proposed zoning insufficiently reflects the need for the highest level of protection for alpine habitats that are crucial for endemic and endangered species of European importance, in particular the Tatra marmot (*M. m. latirostris*) and the Tatra chamois (*R. r. tatrica*). These species occur in isolated populations with narrow ecological requirements and are therefore highly sensitive to disturbance, habitat fragmentation, and environmental change. Long-term monitoring of the Tatra marmot indicates that the most suitable habitats for its occurrence are located in the Western Tatras (Fig. 1). Particularly important areas extend from the Bobrovecká and Jalovecká valleys through the Žiarska, Jamnická, Račkova, Gáborova, and Bystrá valleys to the Kamenistá dolina. These areas represent core habitats essential for reproduction, shelter, and foraging of marmot populations (Ballo 2008a, 2008b, 2009, 2010; Ballo and Sýkora 2003, 2005, 2006, 2007).

From a legal perspective, alpine areas that are natural or only minimally altered by humans fall primarily within the scope of Zone A (§ 30(4)(a)), whereas Zone B is intended for areas that are partially altered and where management aims to restore natural conditions (§ 30(4)(b)). Where alpine areas already exhibit a natural state, the logic of § 30(4) clearly supports their inclusion in Zone A rather than in zones with a lower level of protection. We therefore propose that key alpine habitats of the Tatra marmot and the Tatra chamois, particularly in the Western Tatras, be included in Zone A of the national park, as these areas constitute core habitats for these endemic and endangered species. When delineating the boundaries of Zone A, it is essential to rely on available long-term monitoring data and spatial datasets identifying habitats suitable for the occurrence and reproduction of these species.

Response of the TANAP Administration and counter-arguments

The TANAP Administration classified the comment as not accepted and stated in its response that it proposes to maintain the boundaries of the TANAP zoning as defined in the submitted proposal for the declaration of TANAP zones, changes to their boundaries, and changes to the boundaries of the buffer zone, which are the subject of Public Notice No. OU-PO-OSZP1-2025/069141-002 dated 15 August 2025.

However, a response formulated in this manner does not constitute a substantive engagement with the content of the comment, but merely a statement that the original proposal will be retained without providing any expert justification. For this reason, it cannot be regarded as sufficient either from the

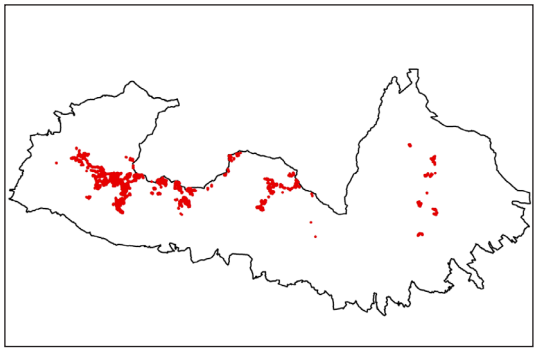

Fig. 1. Map of recorded burrows of the Tatra marmot (*Marmota marmota latirostris*) within the territory of TANAP (P. Ballo, unpublished).

perspective of the legal requirements governing the zoning process or from the perspective of nature conservation. The TANAP Administration does not address the key fact that the affected alpine areas represent core habitats of endemic and endangered species of European importance, whose long-term survival is directly dependent on extensive, weakly fragmented, and undisturbed areas. Maintaining the original zoning boundaries in itself is not an expert argument and cannot substitute for an assessment of the ecological function of the area. The response also ignores the legal logic of Section 30(4) of Act No. 543/2002 Coll., according to which Zone A is intended primarily for areas dominated by natural or only slightly human-modified ecosystems. Alpine habitats of the Western Tatras already meet this condition at present, and therefore their inclusion in lower protection zones contradicts the very purpose of zoning. Under the Act, Zone B is intended for areas that are to move towards a natural state, not for areas that have already reached it.

Furthermore, the TANAP Administration does not comment on the available long-term monitoring data, which clearly identify the Western Tatras as the area with the highest-quality habitats for the Tatra subspecies of the Alpine marmot. This raises concerns that, in the preparation of the zoning proposal, expert data, an essential basis for decisions on the delineation of Zone A, were not systematically taken into account.

The rejection of the comment is also inconsistent with the objective of the national park under Section 19(2) of Act No. 543/2002 Coll., which is to ensure the undisturbed course of natural processes on at least three quarters of its territory. Alpine habitats represent the last areas with minimal direct human influence, and their exclusion from Zone A systematically weakens the achievement of this objective. The response of the TANAP Administration also fails to reflect the international context of the protection of species of European importance. The Tatra subspecies of the Alpine marmot and the Tatra chamois are among the species for which the Slovak Republic is bound by the obligation to prevent the deterioration of their habitats and to ensure a favourable conservation status of their populations. Maintaining the existing zoning without adjustments in core alpine areas is inconsistent with the precautionary principle of nature conservation applied in EU law.

For the above reasons, we consider the rejection of the comment to be unjustified. Retaining the original zoning boundaries without a substantive analysis of the ecological value of alpine habitats and without the use of long-term monitoring data cannot be regarded as either an expert-based or a lawful approach. The inclusion of key alpine habitats of the marmot and the chamois in Zone A is a necessary prerequisite for ensuring the undisturbed course of natural processes and the long-term protection of endemic species in the Tatra National Park.

TANAP – Inappropriate classification of the Jalovecká valley into Zone C

The inclusion of the Jalovecká Valley in Zone C is considered fundamentally unjustified. The valley has exceptional prerequisites for core, non-intervention protection: long-term low intensity of economic use, the absence of a valley road (which substantially limits human pressure), natural forest regeneration following the 2004 windstorm without intensive interventions, and high biodiversity ranging from the montane to the alpine belt. It is the only larger valley complex within TANAP without a valley road. Such an area meets the definition of Zone A as an area dominated by natural or only slightly human-modified ecosystems (§ 30(4)(a)) and at the same time best fulfils the objective of a national park under § 19(2) of Act No. 543/2002 Coll. The valley is also highly significant in terms of protected features. Important lekking sites of the Western capercaillie and the black grouse are present here (Fig. 2), including one of the largest and most important black grouse leks in TANAP. This species is extremely sensitive to environmental change, which is invariably associated with population decline. The area also hosts numerous other species of European and national importance, such as the Tatra chamois, the Tatra marmot, large carnivores (brown bear, grey wolf, Eurasian lynx), Eurasian otter, bats associated with caves and tree hollows, and several bird species linked to well-preserved forests and rocky habitats (e.g. hazel grouse, wallcreeper, peregrine falcon, pygmy owl, boreal owl, Eurasian eagle-owl, European nightjar, Eurasian woodcock, three-toed woodpecker, golden eagle, grey-headed woodpecker, black woodpecker, European honey buzzard, hoopoe).

From an ecological perspective, the function of the area as a water source is also crucial. Well-preserved upper catchment areas without roads or intensive construction have high water retention

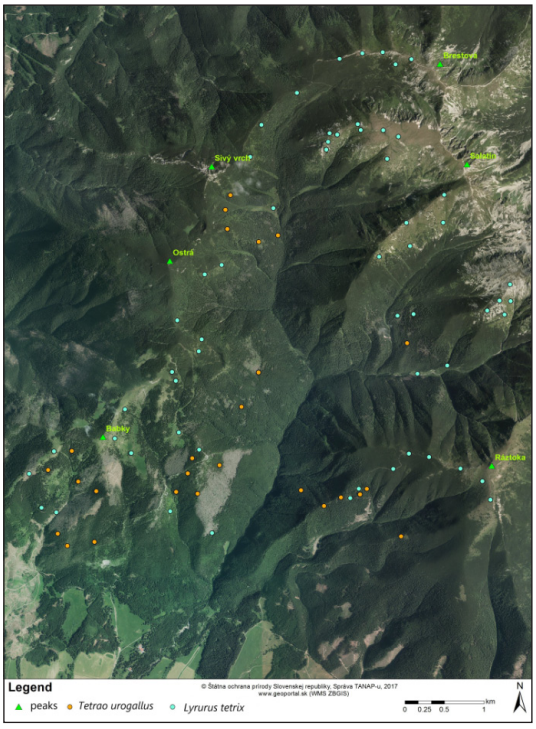

Fig. 2. Locations where the western capercaillie (*Tetrao urogallus*) and black grouse (*Lyrurus tetrix*) were recorded during monitoring in 2013–2017 in the Bobrovecká and Jalovecká valleys (© TANAP Administration).

and self-purification capacity. The protection of waters and water bodies is also a legal obligation of the state under the EU Water Framework Directive (2000/60/EC) and national legislation (Act No. 364/2004 Coll. on waters), while interventions in upper catchments increase the risk of erosion, pollution, and long-term changes in runoff regimes. A further specific circumstance consists of long-standing administrative and judicial disputes related to forestry activities and access roads. Decisions of state authorities and courts that in the past did not permit logging or the construction of forest roads, and did not approve exemptions for interventions in habitats of protected species, demonstrate the high natural value of the area and indicate that arguments based on "the need for economic use" are not convincing in this case. We therefore propose that the Jalovecká Valley be designated as a core Zone A of the national park, at least from the upper parts of the valley with ongoing natural forest regeneration up to the alpine vegetation belt, in order to ensure the undisturbed course of natural processes over a continuous area. In the foothill zone, an appropriate transition through Zone B may be retained, while Zone C should be strictly limited to genuinely anthropogenic elements such as existing mountain huts and access roads in marginal parts of the area. At the same time, it is essential that the justification of the zoning explicitly takes into account the function of the Jalovecká Valley as an important water source, in accordance with the requirements of the Water Framework Directive (2000/60/EC) and Act No. 364/2004 Coll. on waters, which impose an obligation to protect the quality and quantity of surface and groundwater, particularly in upper catchment areas.

Response of the TANAP Administration and counter-arguments

The TANAP Administration classified the comment as not accepted and stated in its response that it proposes to maintain the boundaries of the TANAP zoning as defined in the submitted proposal for the declaration of TANAP zones, changes to their boundaries, and changes to the buffer zone, which are the subject of Public Notice No. OU-PO-OSZP1-2025/069141-002 dated 15 August 2025, without providing any justification.

Such an approach reduces zoning to a purely administrative tool and circumvents its fundamental role as an ecological and conservation mechanism. The fact that an area may be perceived as potentially usable cannot take precedence over an assessment of its actual ecological condition and function within the national park. The Jalovecká Valley is not an area where intensive use must be "balanced" with conservation; on the contrary, it is an area where a low level of human intervention has enabled the preservation of natural processes over a large spatial scale. Maintaining Zone C in an area with demonstrably high natural value further expands the scope for future interventions that may be permissible under the Zone C regime but are incompatible with the objectives of a national park. Zoning should aim to minimise the need for exemptions and subsequent administrative decisions, not to create space for their systematic application.

Particularly problematic is the fact that the response of the TANAP Administration fails to consider the hydrological and landscape-ecological function of the area. Upper catchment areas with minimal fragmentation represent long-term stable water sources with high retention capacity. Classifying such an area as Zone C means that water protection is addressed only indirectly, despite the fact that both EU and national legislation require active prevention of water status deterioration, especially in source areas. The argument of maintaining the original zoning proposal is also inconsistent with the principle of adaptive management, which is essential under conditions of climate change. Areas with high ecological integrity, such as the Jalovecká Valley, are crucial for landscape resilience to extreme events (droughts, floods, windstorms). Their undervaluation in zoning weakens the capacity of the national park to fulfil its stabilising function within the landscape. **Finally, rejecting the comment without substantively addressing the ecological, hydrological, and legal aspects does not provide a transparent justification as to why an area that meets all the criteria of a core protection zone should not be included in Zone A.** Such a procedure undermines the credibility of the zoning process and creates the impression that zone boundaries are the result of administrative inertia rather than expert-based territorial assessment.

TANAP – Classification of land above the upper forest line (communal landowners of Východná, Pribylina, Kokava and Vavrišovo)

We consider the inclusion of land above the upper forest line, owned by the communal landowners of Východná, Pribylina, Kokava and Vavrišovo, in Zone B to be a fundamental flaw of the proposed zonation of the Tatra National Park (TANAP). These areas are of exceptionally high natural value and are of key importance for the conservation of alpine species of European significance. According to § 30(4)(b) of Act No. 543/2002 Coll., Zone B is intended for areas dominated by ecosystems partially modified by human activity, where the management objective is to gradually restore conditions corresponding to natural ecosystems. However, the ridge of the Western Tatras already exhibits such natural conditions at present and therefore, both from a legal and an ecological perspective, it should be classified within Zone A rather than a "transitional" management zone.

The alpine meadows of the Western Tatras represent key habitats of the Tatra marmot (*M. m. latirostris*), a species strictly bound to the alpine vegetation belt, whose highest population densities have been documented through long-term monitoring precisely in this part of the Tatras (Fig. 1; Ballo 2008a, 2008b, 2009, 2010; Ballo and Sýkora 2003, 2005, 2006, 2007). These areas also possess a high carrying capacity for other species of European importance, such as the Tatra chamois (*R. r. tatrica*) and the brown bear (*Ursus arctos*), providing extensive alpine and subalpine foraging grounds. Compared to the High Tatras, where rocky habitats prevail, the Western Tatras offer more continuous vegetated surfaces while retaining a fully alpine

character. In terms of prey availability and shelter, these areas are also suitable for the wolf (*Canis lupus*), Eurasian lynx (*Lynx lynx*) and golden eagle (*Aquila chrysaetos*), whose populations are highly sensitive to disturbance and require large, weakly fragmented territories.

The classification of these areas into Zone B while allowing hunting activities represents a serious contradiction to the primary objective of a national park as defined in § 19(2) of Act No. 543/2002 Coll., namely to ensure the undisturbed course of natural processes over at least three quarters of its territory, as well as to the IUCN recommendations for Category II national parks. Areas above the upper forest line constitute the last natural refuges for wildlife, spatially most distant from intensive human activities; permitting hunting in these zones reduces their refuge function and disrupts population continuity.

From both an ecological and practical perspective, hunting in the alpine and subalpine belts produces negative secondary effects. Wildlife disturbed in natural high-mountain habitats is displaced closer to human settlements, where it causes damage to agricultural crops, paradoxically increasing conflicts between nature conservation and economic interests. Lower protection levels also elevate the risk of poaching, as illegal activities can be more easily disguised as lawful hunting. These risks are not merely theoretical, during monitoring of marmot colonies in the alpine belt of the Western Tatras, signs of poaching were documented at multiple sites (Ballo and Sýkora 2006, 2007). Between 2002 and 2005, staff of the Polish Tatra National Park uncovered two highly organized and well-equipped poaching groups (using infrared optics, small-calibre rifles with suppressors, etc.) operating from the Czerwone Wierchy ridge through the Pyšná Valley to Volovec; it is assumed that these groups also crossed into Slovak territory. During a house search, police confiscated several marmot skins (Lenko 2007). Traces of poaching within marmot colonies have also been observed in recent years (Kompišová Ballová, personal observation).

For these reasons, we propose that all land above the upper forest line administered by the communal landowners of Východná, Pribylina, Kokava and Vavrišovo be classified within Zone A of TANAP, and that hunting be excluded from the alpine and subalpine belts. Such a measure is essential to ensure the long-term function of this area as a core refuge for species of European importance and to maintain the undisturbed course of natural processes in line with the objectives of the national park.

Response of the TANAP Administration and counter-arguments

The TANAP Administration proposed maintaining the zonation boundaries as presented in the original zoning plan, without a substantive evaluation of the ecological and legal arguments raised in this comment. This approach implicitly assumes that alpine and subalpine areas above the upper forest line should remain in Zone B due to ownership structure or the continuation of traditional land-use practices, including hunting. However, such an assumption is inconsistent with the purpose of national park zonation, which, under § 19(2) of Act No. 543/2002 Coll., is to ensure the undisturbed course of natural processes over a decisive part of the territory.

Alpine habitats of the Western Tatras already display characteristics of natural or only minimally human-influenced ecosystems. Their inclusion in a "transitional" Zone B therefore contradicts the logic of § 30(4) of the Act. From an ecological perspective, these areas function as core refugia for the Tatra marmot, the Tatra chamois and other sensitive species, for which even low-intensity disturbance constitutes a significant stress factor.

International IUCN guidelines for Category II national parks emphasize that such protected areas should be managed primarily to conserve biodiversity and ecological processes, and that their status represents an internationally recognized standard for maintaining natural ecosystems in an undisturbed state. Land use in surrounding areas should be coordinated so as not to weaken the integrity of core zones (Dudley 2008). Consequently, the classification of alpine areas above the upper forest line into Zone B does not represent a compromise in favour of nature conservation, but rather a weakening of the national park core and a deviation from established best practice in comparable European mountain national parks. Maintaining these areas within Zone B also creates conditions conducive to the fragmentation of refugia and cumulative disturbance of species whose protection should constitute one of the primary objectives of TANAP.

Fragmentation of the A Zone and Expansion of the C2 Zone (Roháče – Spálená)

We consider the expansion of the C2 Zone in the Roháče–Spálená ski area towards Salatín to be problematic, as it disrupts the spatial connectivity of the A zone and creates an illogical "jump" in protection levels. Zoning should be designed to form coherent spatial units and a logical gradient of protection (§ 30(2)). The direct adjacency of the A Zone and the C Zone without an intermediate B zone weakens the function of the core area and increases pressure on the marginal parts of the A Zone. Moreover, where an area has already been subject to permitting procedures (e.g. Environmental Impact Assessment) with clearly defined limits, any fundamental change in zoning should be transparently justified, including in terms of consistency with previous commitments and assessments.

It must also be emphasised that the issue of fragmentation and weakening of the protection regime in the Roháče–Spálená area does not concern only the expansion of the C2 Zone, but also the classification of ski slopes and cableways into the D Zone, as discussed in detail in the section of this article addressing comments on the zoning of NAPANT. Lowering the level of protection for ski infrastructure further intensifies anthropogenic pressure in sensitive habitats and creates space for interventions that are insufficiently regulated from the perspective of nature conservation. In combination with the expansion of the C2 Zone, this results

in a cumulative weakening of the A-zone core, which is contrary to the objectives of national park zoning and to the principle of maintaining undisturbed natural processes.

We therefore propose that the boundaries of the C2 Zone should not be further expanded and should remain strictly limited to areas with existing cableway structures and related technical infrastructure. At the same time, we propose that these areas with existing infrastructure be reclassified from Zone D to Zone C, in order to ensure a more appropriate protection regime and to strengthen the competencies of the national park administration in regulating their operation and management. Ski slope areas outside these structures should be classified as Zone B, which allows regulated management while maintaining a higher level of protection, thereby preventing further spatial expansion of the ski resort. It is also necessary to assess the consistency of the proposed solution with previous environmental impact assessments (EIA), existing permitting commitments, and obligations arising from Article 6 of the Habitats Directive (92/43/EEC). In the final delineation of zones, preference should be given to solutions that minimise fragmentation of the A-zone core while strengthening key ecosystem services, particularly landscape water retention and the stability of spring areas.

Response of the TANAP Administration and counter-Arguments

The TANAP Administration considers the expansion of the C2 and D2 Zones in the Roháče–Spálená area to be justified, as this is an area with existing or planned tourism infrastructure, including ski slopes, cableway corridors, and development areas defined in spatial planning documentation. According to the Administration, habitats in this area are already significantly fragmented and surrounded by technical infrastructure and therefore cannot be considered a functional part of the core A Zone. The classification of these areas into D2 (second level of protection) is intended to reflect their "de-naturalised" character and existing or recommended development plans assessed through EIA procedures. The expansion of C2 is also intended to create space for future tourism development outside the core of the national park.

However, this approach does not address the root cause of fragmentation; rather, it retrospectively legitimises it. The fact that part of an area has already been disturbed by existing infrastructure cannot serve as a justification for further lowering the level of protection or for expanding zones with a higher intensity of interventions. On the contrary, one of the fundamental purposes of national park zoning is to halt further fragmentation of core areas and to stabilise their boundaries. This principle is explicitly anchored in § 30(5)(b) of Act No. 543/2002 Coll., which allows areas to be included in individual zones even if they do not fully meet the characteristics of zones defined under § 30(4)(a)–(c), where such inclusion is necessary to ensure the integrity of the zone.

The direct adjacency of the A Zone with C2 or D2 Zones without an intervening B Zone creates an abrupt and ecologically illogical shift in protection regimes, increasing pressure on the edges of the core area (noise, human movement, technical interventions, slope maintenance, artificial snowmaking). This "edge effect" is well documented in mountain ecosystems, where it leads to the gradual degradation of core habitats even without direct intervention into their centres (Hansen and DeFries 2007). The IUCN (Category II) explicitly recommends that existing infrastructure in national parks be strictly spatially fixed, while surrounding areas should serve as protective transition zones rather than reserves for future development (Dudley 2008). The approach of the TANAP Administration, which links the classification of areas into C2 and D2 primarily to spatial planning documents, thus reverses the logic of conservation: protection is adapted to development plans, instead of development respecting the limits imposed by nature conservation. Particularly problematic is the cumulative effect of two parallel steps: the expansion of C2 towards the A-zone core and the reclassification of ski slopes and cableways into Zone D. Together, these measures lead to a gradual erosion of the functional integrity of the A-zone core, which is incompatible with the objectives of a national park and with the obligations arising from Article 6 of the Habitats Directive (92/43/EEC), especially the principle of preventing the deterioration of habitats.

TANAP – Conclusion

The proposed zoning of the Tatra National Park (TANAP) was prepared and discussed in a situation where the TANAP Administration did not have complete and up-to-date data on the occurrence of several protected species of European and national importance. During the consultation process, the Administration itself acknowledged that the mapping of species, habitats, plants, and fungi has not been completed, primarily due to insufficient staffing capacity. Although the Administration states that map layers and their graphical presentation will be further refined in the future, zoning, as a key instrument of territorial protection, is being approved without a comprehensive understanding of the actual distribution of conservation features. **This approach contradicts the principles of scientific adequacy and the precautionary principle.**

The resulting zoning is also inconsistent with the scientific proposal for national park zoning based on available ecological data, biodiversity conservation principles, and the requirement for spatially coherent core areas with undisturbed natural processes (Topercer *et al.* 2014). The departure from this expert-based proposal was not transparently or substantively justified by ecological arguments, but rather by administrative and ownership considerations.

The course of the public consultation indicates that significantly greater weight was given to comments submitted by landowner associations, local governments, and stakeholders with direct economic or development interests. In contrast, comments submitted by individuals, experts, and environmental organisations, formulated in the in-

terest of nature conservation and the public good, were largely rejected or merely "taken into account" without being meaningfully incorporated. Such a procedure is inconsistent with the objective of a national park as defined in § 19(2) of Act No. 543/2002 Coll. and weakens the function of zoning as an instrument of nature protection rather than a compromise between conflicting interests.

National park zoning should be the result of an expert synthesis of ecological knowledge, not an administrative averaging of particular interests. In the case of TANAP, however, the proposed zoning in its current form fails to reflect available scientific evidence, disregards incomplete monitoring data, and systematically weakens the protection of core areas, thereby creating a risk of long-term deterioration of habitats and populations of protected species in conflict with both national and European legislation.

At the same time, zoning decisions should explicitly reflect the broader context of climate change and increasing pressure on natural resources. Water resources are not unlimited, and mountain forests play an irreplaceable role in water retention, flood mitigation, erosion control, climate regulation, oxygen production, and the long-term stability of ecosystems. In this context, the protective and regulating functions of forests and alpine ecosystems should be prioritised over short-term economic interests or individual land-use claims, as they represent a fundamental public interest and a key prerequisite for societal resilience under changing climatic conditions.

Marián Janiga

Critical commentary, fundamental comments, and requests for change

NAPANT – proposed duration of the zoning concept – 2026 – 2055

30-year planning horizont is anachronism in the current times. The argument that a 30-year planning horizon is an anachronism in an era of exponential technological growth (AI, digital transformation of the economy) is very rational. Legal certainty requires stability, but in an environment where conditions change every few years, too much stability turns into rigidity, which hinders effective protection and development. The Slovak Government Regulation is a subordinate legal act. If the parent law changes (which is inevitable given the dynamics of AI and the economy), legislative inconsistency arises. If the Care Program is tied to a 30-year period, its ongoing updating tends to be extremely administratively demanding. Consequence – a legal vacuum arises, or a situation where outdated standards are followed until new legislation is "pushed through". For example, the difference between the 10-year plan in Tatra National Park and the proposed 30-year horizon in other areas creates conceptual chaos. After national parks have obtained legal personality, it is crucial for the state to set uniform "rules of the game". Different time horizons for zoning complicate strategic planning at the national level. For example, in Poloniny National Park, B30 Zones were even proposed with the idea that after 30 years of forest management, Zone B would be reclassified as A Zone.The impact of technology on nature conservation (e.g., satellite monitoring, AI analysis of biodiversity, predictive models of climate change) changes in cycles that are more likely to be 3 to 5 years rather than 30. A 30-year plan cannot reflect new land management methods that do not even exist today. Care programs spanning three decades do not reflect the acceleration of climate change or technological progress. What was unimaginable in IT 10 years ago is now standard. Shifting from rigid, long-term management to an **adaptive management** framework is increasingly seen by conservationists as the best way to handle the rapid environmental shifts we are seeing today. Research in ecology moves fast. A 5-year cycle ensures that the latest DNA monitoring techniques or soil health data are actually used in policy. At the Institute of High Mountain Biology, Žilina University we are prioritizing **adaptability,** which is vital when dealing with high-altitude ecosystems that are often the "canaries in the coal mine" for environmental change. Setting a 10-year limit on zonation and care plans strikes a smart balance between long-term stability and the need for scientific "course correction". In alpine environments, a lot can happen in a decade, from shifting timberlines or snowlines to changes in migratory patterns.

NAPANT – inconsistency with the current wording of the Nature and Landscape Protection Act in sections relating to zoning (Baranovo SKUEV0299, Brezinky SKUEV0297, Brvnište SKUEV0298, Červený grúň SKUEV0150, Demänovská slatina SKUEV0061, Ďumbierske Tatry SKUEV0302, Horné lazy SKUEV0153, Jelšie SKUEV0059, Kopec SKUEV0301, Kráľovohoľské Tatry SKUEV0310, Salatín SKUEV0197, Suchá dolina SKUEV0154, Škribňovo SKUEV0300, Tlstá SKUEV0058, Turková SKUEV0296).

I am a member of the NAPANT Park Council. At the meeting of the Park Council on August 27, 2025, we learned that the background materials for zoning were prepared by the National Forestry Center, which undoubtedly based its work on units of spatial division of the forest with little consideration of the Nature and Landscape Protection Act in the area of zoning. The result, especially in Zone A, is not a zone in the sense of the IUCN recommendations on zoning, but quite the opposite, the creation of red islands and islets (see images below), i.e., fragmentation or anti-zoning (Fig. 3). Unlike economic forestry legislation, the primary purpose of zoning and the management program is to **preserve processes** in ecosystems and their natural stabilization in the current climate, leading to eco-stability. Compact valley complexes play an important role here in terms of morphology, microclimate, response to disturbances, etc. From this point of view, the map of proposed zones corresponds, for example, very little with Map 6.7.4. showing potential watercourse management. My concerns stem from a fundamental shift in perspective: moving from a **spatial forest management** approach (based on economic units) to an **ecosystem-based** approach (based on ecological processes). Here are three strategic points that

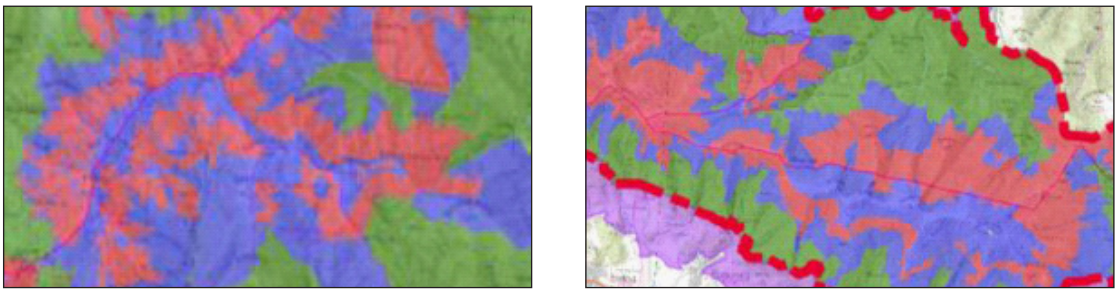

Fig. 3. The image on the left shows a section of the proposed A Zone map (red colour) in the area defined by the Latiborská hoľa – Malá, Veľká Chochuľa ridge, while the image on the right shows the ridge section of the Kráľovoholské Low Tatras. Source: Low Tatras National Park Service, Zone Map, as of September 2025.

could be used to advocate for a revision of the current proposal:

Fragmentation vs. Connectivity: The "islands" in Zone A (strict protection) create an edge effect that makes the interior vulnerable to windthrow and temperature fluctuations. According to IUCN guidelines, a core zone should have a high area-to-perimeter ratio to ensure **eco-stability.**

The Watershed Disconnect: In mountainous terrain like the Low Tatras, hydrological continuity is the "nervous system" of the park. If Zone A ignores the valley complexes and watercourse paths, it fails to protect the very processes that regulate local climate and water retention.

Legal Hierarchy: While forestry legislation focuses on timber cycles, the Nature and Landscape Protection Act mandates that National Park zoning must prioritize biodiversity and natural evolution. If the NFC materials used a methodology that predated or bypassed these legal requirements, the zoning may be legally vulnerable.

However, I consider it even more serious that the document processor did not include in Zone A plots owned or managed by the state, as well as non-state land, which the Slovak Republic has committed to strictly protect by implementing the Slovak Republic's Recovery and Resilience Plan. The Capercaillie Rescue Program for 2025–2029. The plan was approved by the Ministry of the Environment of the Slovak Republic and defines the habitats of this species in which passive management is applied. At the same time, as part of Component 5 of the Slovak Republic's Recovery and Resilience Plan, the Slovak Republic has committed to including old/natural forests and primeval forests in Zone A of national parks. The conservation project was not developed in accordance with the Slovak Republic's Recovery and Resilience Plan – part of the old and natural forests are missing. I propose adding primeval forests, primeval forest remnants, natural and old forests to Zone A on all plots where capercaillie and primeval forest habitats are located according to known documentation. I believe that this will greatly contribute to the integrity of Zone A and the protection of some valley complexes.

As of December 2025, the National Park Service has only partially and complied with the requirement for connectivity of habitats and their natural processes when considering this comment.

TANAP, NAPANT – ski trails and slopes, downhill skiing, and recategorization to zone D.

The tension between the ski industry and nature protection has reached a boiling point in Europe, particularly following the widely publicized directives from the Slovak Ministry of the Environment in late 2025. While these directives aim to tighten the reins on development in sensitive areas, scientific data from the Alps,the most researched mountain range in this context, provides a sobering look at the long-term ecological "footprint" of ski slopes.

Impact on soil and vegetation. Research from teams in the Alps consistently shows that the construction and maintenance of ski runs fundamentally alter the physical and chemical properties of alpine soil. The "grading" (leveling) of slopes removes the top layer of fertile soil. Studies show that these areas exhibit significantly lower organic matter and nutrient levels, leading to accelerated soil erosion that is 4–10 times faster than natural formation. Native alpine plants are often replaced by a few resilient, "seeded" grass species. Research indicates that even decades after a resort is abandoned, the soil often fails to recover its original carbon-sequestration capacity. Artificial snow is denser and contains more minerals and often chemical additives. This leads to: delayed snowmelt (shortening the growing season by weeks), and soil "ice-crust" formation, which suffocates plants and prevents oxygen from reaching the roots (e.g., Meyer 1993, Krammer 2002, Hudek *et al.* 2020).

Impact on alpine fauna (Biodiversity). Many analyses of European studies (specifically focusing on birds, mammals, and arthropods) indicate that winter recreation has an overwhelmingly negative effect on local wildlife. Ski runs act as "semi-permeable barriers" for small mammals and invertebrates, isolating populations. The "Edge Effect": Some species of birds show synanthropy, lower species richness and occurrence rates not just on the slopes, but in the forest edges adjacent to them. High-tension cables and lift infrastructure are major hazards for tetraonids (like the capercaillie), leading to frequent fatal collisions. (e.g., Miquet 1986, Schnidrig-Petrig 1994, Enggist-Dublin and Ingold 2003, Signer *et al.* 2011, Janiga 2022)

Hydrological, climate strain and energy consumption. As natural snow becomes scarcer, the reliance on technological adaptation (snowmaking)

creates a "vicious circle." A one-hectare slope requires approximately 1 million liters of water for a basic layer of artificial snow. This often depletes local groundwater precisely when it is at its lowest seasonal level. Supplying alpine resorts with artificial snow consumes huge amount of GWhours annually (e.g., Grunewald and Wolfsperger 2019)

Many factors influence the impact of ski slopes on nature. In NAPANT (Jasná) Slovakia has a European-standard ski resort, which is a good thing. However, it is important to realize that the effect of resorts on biota is much broader than the idea published in the popular press that ski slopes influence only one percent of protected park areas. The NAPANT Administration is a legally established organization that ensures the protection of species and territory in the national park for all Slovakian citizens. If it fails to do so, or acts contrary to its purpose, it has no legal right to exist. Reclassifying ski slopes and lifts to Zone D would seriously weaken the NAPANT and TANAP administrations' ability to protect nature in the parks and remove their decision-making power. The Polish Tatra National Park manages the ski slopes on Kasprowy Wierch under the strictest level of protection (Zone A), and no one objects. At the fifth meeting of the NAPANT Council, both the representative of the local government in Demänovská Valley and the representative of the local forestry community expressed a similar opinion (Zone C).

In the case of TANAP, the TANAP Administration presented ski slopes in Zone C to the 12th TANAP Council in July 2025. By December 2025, at the 13th TANAP Council, ski slopes had already been built in Zone D. This demonstrates that the TANAP Administration took a different, more professional approach to the problem. However, the zoning was changed to Category D under unscientific pressure from interest groups. This change did not take into account the impact of ski slopes on rare biota, nor did it allow the TANAP Administration to have a more significant influence on activities in these areas. This comment is fundamental. I requested that the plots with ski lifts, cabins, and ski slopes be reclassified to at least Zone C. Regarding Spálená dolina and Salatín, I strongly requested that the state-owned land remain in alpine vegetation Zone A and that no alterations be made to this ridge of the Western Tatras.

The TANAP Administration and NAPANT did not comply with this request in their statements (December 2025).

TANAP – The historically and biologically unique valley complexes of Bielovodská and Javorová valley

The minutes from the last two National Park Council meetings show that most council members had no objections to clearly classifying the preserved valley complexes on state-owned land as Zone A, as determined by historical circumstances. The valleys largely survived thanks to Prince Hohenlohe, the governments of the First Czechoslovak Republic, and the Czechoslovak Socialist Republic. Only in the last 20 years have the valleys increasingly become the target of attacks by various interest groups. The Council also documented that, after the forest in the valley was cut down after 2010, the bark beetle spread more widely in the valley and that conser-

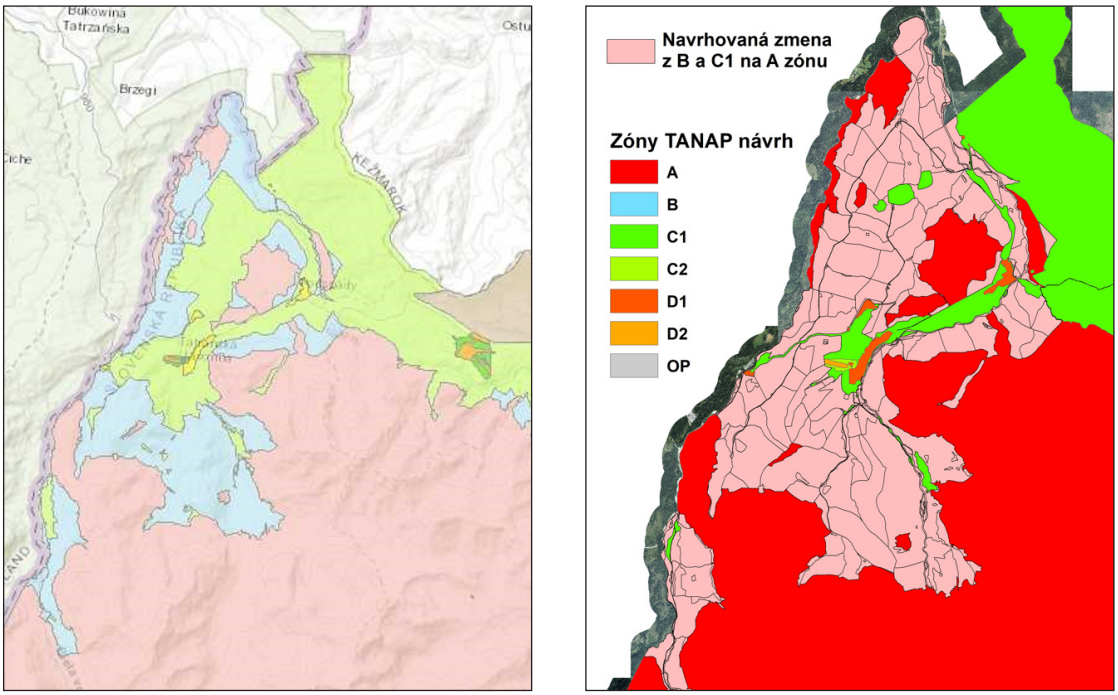

Fig. 4. The figure on the left shows the zoning status of the Bielovodská and Javorová valleys as of December 2025, when the TANAP Administration finished the zoning process. The blue (B) and green (C) Zones remain largely intact, so forestry measures can always be carried out in the area. However, there is no intention to proceed in accordance with the Nature and Landscape Protection Act to protect the valleys. Zone A is marked in red. The right side of the figure shows a proposal from the Institute of High Mountain Biology. We request that the areas marked in pink be reclassified as Zone A, which coincides with the "Scientific zonation" of TANAP offered to the Ministry of Environment approximately ten years ago.

vation forestry activities to suppress these beetles were unsuccessful. The classification of the valleys as Zone A is determined not only by their natural value and compatibility with the zoning solution in the Polish TPN, but also by the effort to preserve the landscape's maximum retention potential. This is important because the Javorinka stream is a source of drinking water for the entire Ždiar region, and its flow rates are systematically declining. This was also documented at the Park Council meeting. I requested that the following plots be reevaluated and classified as Zone A (Fig. 4.).

The TANAP administration's response only marginally complied with the request, primarily by reclassifying many areas from Zone C to Zone B, which allows for random logging. According to the Forest Act, the report argues that young stands require two "thinning" interventions and will only be reclassified to Zone A in the future. However, this argument is irrelevant because the zone maps are only valid for ten years according to the Government Regulation. Most stands classified as Zone B were so designated to "implement measures to improve capercaillie habitats," after which they will be reclassified as Zone A. At the Park Council meeting in December 2025, the TANAP Administration again argued that the park needs these lower-zone lands to obtain EU funding for projects. These arguments are vague and laughable. Zoning is a clear process that cannot be influenced by the possibility of obtaining projects. As for capercaillie, the species already inhabits the valleys on both sides of the border, and logging threatens it more. The most truthful argument was made by the TANAP Administration at the Park Council meeting in July 2025 when the former director stated that the areas in the lower zones would remain available for logging for economic reasons. The TANAP Administration's position clearly shows that its zoning does not follow the details of the Nature and Landscape Protection Act; rather, the static Forest Act is the priority.

NAPANT, TANAP – Errors in submitted documents

The submitted materials contain a relatively large number of errors, mainly in the area of nomenclature, classification into systematic groups of biota, etc. I understand that the NAPANT Administration with statutory powers is still young, but the material is, after all, the basis for the Slovak Government Regulation and will undoubtedly be required for inter-ministerial commenting to ensure that it is correct, accurate, and, above all, in accordance with other legislation guaranteed by ministries other than the Ministry of the Environment. Personally, I believe that such an important document should have been prepared by the NAPANT Administration in cooperation with professional academics in the fields of botany and zoology. As far as TANAP is concerned, the Park Council stated that the compilation of the Management Plan does not reflect the work of a large team of authors; rather, the material is the work of an individual who, although he made a great effort to prepare it well, was unable to cover such a complex issue.

Zoning has no scientific basis, or rather, a very weak one. Recent knowledge of the ecology of flora and fauna, not just the spatial distribution of forests, should form the foundation of zoning. While negotiations with local governments, owners, and interest groups are important, they are not the core of zoning in a national park. The result is therefore subpar. For instance, the TANAP administration does not want to expand Zone A in the rare and peaceful Javorová Valley. Instead, they place it in the ecologically functional area around tourist chalets, which receive a huge number of visitors in the summer. In the fall, chamois run through the alpine stage from Temniak to Kamenistá or Bystrá Valley, from Zone A to Zone B, essentially in the same habitat. B**y catering to many interest groups, zoning has lost its scientific basis.** As far as I know, the administration did not negotiate with academic and university institutions, many of which have current, good databases on the occurrence of fauna and flora.

Martina Haas

Critical commentary, fundamental comments, and requests for change

NAPANT – Use of pesticides in Zone A of the Low Tatras National Park

On page 71 of the Management Programme for the Low Tatras National Park and its Buffer Zone, it states: "It is also necessary to prevent large-scale and, indeed, any use of pesticides in the Low Tatras National Park, except for the removal of invasive non-native plant species, which will be carried out in accordance with Decree No. 450/2019 Coll. of the Ministry of Environment of the Slovak Republic." However, on page 77, in the section Principles of Care for Agriculture, Hunting and Forestry, a specific example is given: "Spot application of chemical agents for the protection of young forest stands managed by the Land Association of Private Forest Owners in Liptovská Porúbka." In several places in the document, pesticides are mentioned in brackets alongside chemical substances.

In Zone A of the Low Tatras National Park, which is intended to ensure the undisturbed course of natural processes, any use of pesticides, including spot application of chemical agents, is unacceptable. The exceptions stated in the document (e.g., application for the protection of young forest stands) are in direct conflict with the principles of a non-intervention regime. We recommend that the use of pesticides in Zone A be explicitly prohibited without exception, and that all references to their application in this zone be removed from the document or relocated to zones with a lower level of protection.

I propose **explicitly prohibit the use of pesticides in Zone A of the Low Tatras National Park without exception, allowing only mechanical, biological or ecological methods.** Chemical interventions should be permitted solely for invasive species control, in strict compliance with Decree No. 450/2019 Coll., and subject to expert assessment and approval by the park administration. All chemical interventions in other Zones (B–D) must be regulated and recorded in a central database to ensure transparency.

Zone A is legally designated as a non-intervention area under Act No. 543/2002 Coll., and pesticide use contradicts the principle of undisturbed natural processes. If a private forest owner is prohibited from managing their forest in Zone A due to non-intervention rules (including pesticide bans), §35 mandates compensation for such restrictions on forest management (Act No. 326/2005 Coll.). Therefore, granting a special pesticide-use exception is unnecessary and the owner should instead receive compensation as per the law.

The NAPANT Administration has accepted the comment and, in its written statement following the oral hearing, declares that it will amend the texts accordingly.

NAPANT – Water abstraction limits

The Management Programme for the Low Tatras National Park and its Buffer Zone does not specify clear limits for water abstraction from sources located within the national park and its buffer zone. Given the importance of water resources for the ecological stability of the area and their role in maintaining the biodiversity of wetlands, watercourses and dependent habitats, it is essential to define maximum permissible volumes of water abstraction for different purposes (technical, agricultural, recreational, supply), taking into account seasonal flow variations and climate change impacts on water availability. Monitoring and control of water abstraction must be ensured to prevent threats to aquatic ecosystems.

We recommend that the document include specific quantitative limits or references to relevant water management plans that define these limits, and that these limits become part of management measures for the protection of water resources in the Low Tatras National Park. Although water protection is regulated by Act No. 364/2004 Coll. (Water Act), water sources, both surface and groundwater, are integral to the ecosystems of the Low Tatras National Park and therefore require explicit safeguards within the management programme. I recommend setting quantitative limits for water abstraction for all users, reflecting seasonal flow variations and climate change impacts, and prohibiting new abstractions in Zone A except for essential public supply. The programme should also include measures to restore the natural water regime (wetlands, springs, streams) and implement regular monitoring in cooperation with state water authorities. This approach supports biodiversity, ecosystem resilience and the "One Health" principle, recognising the interdependence of water, nature and human well-being.

The comment was partially accepted and assessed as justified. The scope of water abstraction, its treatment, and subsequent handling is determined by the state water authority. During the commenting procedure, the NAPANT Administration requested cooperation in the preparation of the texts and in determining the limits in the relevant area. The NAPANT Administration does not have any supporting materials for determining quantitative limits, nor for referencing the relevant water management plans. The TANAP Administration has requested the preparation of the necessary background documents or proposed wording, which could be incorporated into the Care Programme if submitted during the approval process of the Integrated Care Programme (IPK).

NAPANT – Wastewater Management

The Management Programme for the Low Tatras National Park and its Buffer Zone lacks a systematic approach to wastewater management across the different protection Zones (A, B, C, D). The document does not set requirements for technical solutions (e.g., wastewater treatment plants, sealed systems) for facilities located within or near the park, nor does it regulate the discharge of wastewater into soil or watercourses, particularly in ecologically sensitive areas, which may also occur in zones with lower protection levels.

Since wastewater poses a significant risk to the quality of water resources, wetlands and aquatic habitats, the document should:

- Explicitly define rules for wastewater management in zones with lower protection levels where wastewater generation is expected;
- Establish minimum technical requirements for facilities in Zones B and C (e.g., mandatory treatment plants or sealed tanks);
- Include monitoring and control mechanisms to ensure compliance with these rules.

We also recommend adding technical requirements for facilities in Zone D, given the need to protect groundwater, cave systems and hydrogeologically sensitive areas that may be indirectly affected by improper wastewater management, and considering the location of Zone D near areas with higher protection levels. We purpose explicitly include rules and technical requirements for wastewater management in the management programme for Zones B, C and D, where facilities may produce wastewater. These should mandate appropriate treatment systems (e.g., wastewater treatment plants, sealed tanks), monitoring and control mechanisms. Although wastewater management is regulated under other laws (e.g., Act No. 305/2018 on integrated permitting and Act No. 543/2002 on nature protection), wastewater poses a serious risk to wetlands, cave systems and groundwater within the national park. The programme should therefore integrate these requirements to prevent contamination, ensure compliance with environmental standards and protect sensitive ecosystems.

The comment was assessed as justified, in accordance with the expert evaluation of the NAPANT Administration. The comment was not accepted due to the highly specific nature of the issue concerning wastewater treatment, handling and monitoring. The Administration is not professionally competent to implement technical measures required for the systematic resolution of wastewater management within the individual protection Zones (A, B, C, D). A comprehensive.

TANAP – Protection of ecological processes

The document (Management Programme for Tatra National Park and its Buffer Zone, SKUEV0307 Ta-

try, for the years 2025–2034, hereinafter referred to as the "Management Programme") is primarily focused on species protection and habitat conservation. According to Act No. 543/2002 Coll. on Nature and Landscape Protection, a national park is an area of exceptional natural value whose primary purpose is the protection of the natural environment, preservation of biodiversity, conservation of habitats and species, support for natural ecological processes, and ensuring the sustainable use of the territory in accordance with the principles of nature protection (§11, §65b).

The document provides very limited or vague descriptions of the activities through which the TANAP Administration intends to safeguard ecological processes. Species protection alone does not guarantee the protection of ecological processes. Restrictions on interventions, general and specific habitat protection, prohibitions and activity regulations address ecological processes only partially. The strategic objective of zoning should not be limited to the protection of structures (species, habitats, etc.), but should primarily focus on the protection of the processes that create and maintain them (Topercer *in* TANAP Zoning Working Group 2011). The Management Programme does not define a territorial system of ecological stability, i.e., an interconnected network of biocentres, biocorridors and interaction elements. Biocorridors are mentioned only in the descriptions of activities under operational objectives (1.5; 1.9; 1.10), and solely in relation to species of European importance. I propose that ecological processes be explicitly included among the conservation objectives. In the section "Conservation Objectives", I recommend adding a separate long-term **objective, No. 3: To preserve and promote natural ecological processes as a fundamental prerequisite for maintaining biodiversity and ecological stability within the territory**.

The TANAP Administration acknowledges the stated comment; however, it does not further declare the implementation of the remark and does not propose any specific measures for the protection of ecological processes within the care programme, even though, during the oral hearing, the TANAP representative agreed to include Specific Objective No. 3 in the document.

TANAP – Territorial integrity

When defining zoning, it is necessary to take into account, among other aspects, the valley continuum and to protect the landscape structure based on its integrity (Wiezik *in* TANAP Zoning Working Group 2011). The protection of entire valley systems as gradient structures is also essential from the perspective of long-term scientific biological knowledge, which Slovak natural scientists used when delineating TANAP in its early stages (Janiga *in* TANAP Zoning Working Group 2011). However, the current proposal for zoning does not respect these recommendations, and the mapping materials of the prepared zoning fragment the national park, illogically designating small areas with a lower level of protection between areas with a higher level of protection. Such differentiation of the territory entails heterogeneous interventions into valley systems.

How does the national park intend to ensure the integrity of protection while fragmenting the territory with patches of lower protection within Zone A, or vice versa? The TANAP Administration bases its approach on the actual condition of the protected subjects, on the established conservation objectives, as well as on the socio economic development of the Tatras and their foothills. We agree that a unified protection of entire valley complexes, coherent areas and landscape units is more effective and, at the same time, less costly. The TANAP Administration has designated the Tichá, Kôprová, Bielovodská and Javorová valleys for a predominantly passive management regime with the aim of ensuring the integrity of the territory and reducing its fragmentation. Thus indicating a partial acceptance of the comment. However, the declaration of a 'predominantly passive management regime' is not explained in concrete terms and gives rise to considerations regarding potential management interventions or even a reduction of the protection level in certain parts of the aforementioned valleys.

TANAP – Scientific approach

Zoning is regarded internationally as a key strategy for combining land use with nature conservation. Conservation is the primary and essential function of a national park; therefore, the development of zoning should primarily involve biologists, geographers and other natural scientists, and should be based on scientific knowledge, principles and international guidelines (Topercer *et al.* 2014). Subsequently, following good practice from abroad, visitor management and tourism should be derived from nature conservation. Land use is thus directly linked to and dependent on nature protection.

The prerequisite for this concept is the application of current scientific findings and recommendations, as well as the adoption of best practices in management and conservation programmes. The references in the Management Programme cite only one source (apart from amended legislation) that is less than 10 years old. On what recent scientific evidence were the proposed zones, activities and measures based? Which current (not older than 10 years) research results were used in preparing the Management Programme? The document also lacks recommendations from the European Commission concerning the management of habitats, protected areas and species. It refers only to Commission Decision 2008/218/EC of 25 January 2008 (p. 17) in relation to the inclusion of sites of European importance in the Natura 2000 network within the Alpine biogeographical region.

I propose **ensure scientific participation in zoning and strategic planning by establishing an expert working group (biologists, ecologists, geographers, etc.) and integrating up-to-date research findings and EU guidelines into management documents.** Publish the scientific basis for zoning, including methodology, references and maps, and implement a system for scientific validation and regular evaluation of measures. Guarantee transparency by creating an online database of research, monitoring and supporting data. In the written statement submitted following the oral hearing, it is noted that the na-

ture conservation documentation contains a list of the literature used and cited. This line of argumentation is insufficient, given that the sources used include older works that reflect current knowledge only to a limited extent.

TANAP – Data for the future Management Programme

As the current management programme is prepared for a ten-year period, a new programme will need to be developed once this term expires. **On what basis does the TANAP Administration intend to build the next programme?** The current programme for 2025–2034 does not include plans for implementing inventory research. It only declares monitoring of species and habitats of European importance (e.g., p. 135; section 3.3 Measures to Achieve Conservation Objectives, Timetable and Measurable Indicators of Their Fulfilment, Responsible Entity).

Monitoring alone is insufficient to obtain comprehensive and accurate information on the condition of habitats (particularly their degradation, succession, fragmentation), biodiversity hotspots, and detailed data on specific species and their populations, as it does not provide an in-depth analysis of the causes of change (e.g., climatic factors, invasive species, anthropogenic pressure). It also fails to deliver information on functional ecological connectivity between habitats or interactions between species and their environment.

It is desirable to complement monitoring with inventory research, ecological modelling (species distribution models, habitat suitability), genetic analyses of populations (to determine genetic diversity and isolation), landscape ecology studies and GIS analyses (identifying hotspots, fragmentation, and connectivity). Such data are and will remain crucial for preparing future management documents, rescue programmes, and restoration projects. In other words, does TANAP intend to determine the actual occurrence and abundance of rare and common species solely on the basis of observations? Have biodiversity hotspots been identified within TANAP? If so, why are they not addressed in the document? If not, why is this topic not planned for consideration in the coming decade?

I propose **include comprehensive inventory research as a core activity, complemented by ecological modelling, genetic analyses, GIS-based biodiversity hotspot mapping, and landscape ecology studies.** Ensure interdisciplinary collaboration with scientific institutions and guarantee transparency by publishing methodologies and research outputs in an accessible online database.

In the written statement submitted following the oral hearing of the comments, it is stated that Chapter 4.2 of the Care Programme sets out the method for evaluating the measures implemented and the status of the protected subjects. The implementation of the measures will be monitored by the TANAP Administration in accordance with the specified deadlines and established indicators. Based on the results of these inspections, the evaluation of the implemented measures will be carried out, and these outputs may provide grounds for updating and preparing a new Care Programme. Throughout the validity period of the Care Programme, monitoring and mapping of the protected subjects will also be carried out on an ongoing basis."

TANAP – Forest restoration after disturbance

In several places, the document states: "On calamity-affected areas … leave at least 10 trees per hectare…" (e.g., p. 138; Operational Objective 1.2: In other zones (outside Zone A), maintain and/or improve the condition of forest habitats of European and national importance (Ls4, Ls5.1, Ls5.3, Ls5.4, Ls6.2, Ls6.3, Ls8, Ls9.1, Ls9.2, Ls9.3 and Ls9.4), selected plant and animal species associated with them, and promote ecologically stable forest ecosystems with natural biodiversity).

Why was the minimum number set at 10 trees if the conservation objective is to support ecologically stable forest ecosystems and restore stands in a nature-friendly manner? In Northern European countries (Sweden, Finland, Norway), the practice is to leave 10–30 trees per hectare (usually old, ecologically valuable individuals) and retention groups (0.1–0.5 ha). European biodiversity guidelines (EU Biodiversity-Friendly Guidelines) recommend, after disturbances (windthrow, fire), leaving part of the original stand as "biological legacy," particularly old trees, deadwood, and habitat trees, amounting to at least 5–10% of the original wood volume or 10–20 trees per hectare (European Commission 2023).

International recommendations for biodiversity conservation suggest retaining 5–30% of the original stand or 10–30 trees per hectare, depending on the objective—production versus conservation (National Forest Foundation 2015; Northwest Natural Resource Group 2019). Setting the minimum number at the lower end of recommendations evokes productivity rather than conservation. For biodiversity restoration and stabilisation, the number of retained trees is critical (Gustafsson *et al.* 2020).

I propose **increase the minimum number of retained trees on calamity-affected areas to 20–30 per hectare**, in line with EU Biodiversity Guidelines (2023) and best practice in Northern Europe, and establish retention groups (0.1–0.5 ha) as biological legacy. **Prioritise ecologically valuable trees** (habitat trees, old individuals, deadwood) and **implement monitoring of biodiversity indicators and stand stability at regular intervals.**

The TANAP Administration has accepted the comment and, in its written statement, declares its intention to amend the management measures for forest habitats.

TANAP – Care for Rare (EU-Listed) Animal Species

In section 3.3 Measures to Achieve Conservation Objectives, Timetable and Measurable Indicators of Their Fulfilment, Responsible Entity (from p. 135), activities for specific species are listed. For species such as the Tatra chamois (*Rupicapra rupicapra tatrica*), Tatra marmot (*Marmota marmota latirostris*), grey wolf (*Canis lupus*), Eurasian

lynx (*Lynx lynx*), and others, the activities include monitoring, population assessments, and in some cases genetic and health checks.

However, for the brown bear (*Ursus arctos*), activities focus solely on mitigating human-related conflicts (e.g., securing waste, protecting beehives and livestock, safeguarding agricultural areas, limiting sports events and disruptive activities during hibernation, and supporting the intervention team dealing with human-bear conflicts; pp. 161–164). While these measures are undeniably important, the programme lacks actions for monitoring the target species, assessing population size, or checking genetic and health status. This approach suggests a division of species into "rare," deserving increased attention and care, and "problematic," where the priority is human safety. The Management Programme should prepare measures for future conservation, not only address current societal issues.

A similar approach is evident for amphibians (Operational Objective 1.23: *Improve the status of amphibian species – yellow-bellied toad (*Bombina variegata*), Carpathian newt (*Triturus montandoni*), alpine newt (*Triturus alpestris*), and fire salamander (*Salamandra salamandra*), pp. 189–191), where health checks are also omitted. Given the dramatic declines in amphibian populations, long-term management programmes must address potential diseases, such as chytridiomycosis – an infectious disease caused by chytrid fungi (*Batrachochytrium dendrobatidis* and *Batrachochytrium salamandrivorans*). Although its occurrence has not yet been confirmed in Slovakia, research indicates that climatic conditions in Central Europe, including Slovakia, provide a suitable environment for the spread of both pathogens (Sun *et al.*, 2023).

Monitoring the health and genetic status of populations of all species should be a key priority for maintaining ecosystem stability.

I propose **include population monitoring and genetic and health assessments for brown bear (*Ursus arctos*) and amphibians** in operational objectives. Implement regular testing for chytridiomycosis in amphibians and use non-invasive genetic methods for large mammals to ensure biodiversity conservation and ecosystem stability.

The TANAP Administration has partially accepted the comment and, in its written statement, has committed itself to reconsidering the measures and supplementing them as appropriate.

TANAP – Tourism

The statement that land use is linked to and directly dependent on nature conservation also applies in reverse: tourism can serve as a source of funding and support for conservation. Tourism in TANAP represents one of the main forms of land use, with more than 2 million visitors annually, creating significant pressure on the natural environment.

In the Management Programme, tourism is regulated under Act No. 543/2002 Coll. on Nature and Landscape Protection and the TANAP Visitor Regulations, which define permitted activities within zones (e.g., movement along marked trails, seasonal closures or time restrictions, prohibition of expanding mountain huts or increasing their capacity). However, the programme does not address regulating visitor numbers or the potential introduction of entrance fees.

Although TANAP Administration has long monitored visitor numbers, with peak intensity recorded during the summer season, the results of these monitoring efforts are not included in the Management Programme. Activities are not specifically aimed at addressing the problem of overloaded tourist routes, which has become increasingly evident in recent years, particularly in highly attractive and frequently visited areas (Fig. 5–7). Setting visitor limits or introducing other regulatory measures could help prevent overloading and thereby reduce direct negative impacts on nature, such as habitat fragmentation and degradation or disturbance to wildlife. Such measures require the preparation

Fig. 5. Hiking trail to the Chalet under Rysy, 13 September 2025. (Source: www.presovak.sk, 2025)

Fig. 6. Tourists at Rysy in 2020. (Source: www.spisgemer.korzar.sme.sk, 2020)

Fig. 7. Tourists in the Tatras, 2020. (Source: www.poprad.dnes24.sk, 2020)

of regulations and activities that reflect the current situation and provide realistic solutions.

I propose conducting **regular visitor monitoring and publishing the data, using it to manage tourism pressure on sensitive areas**. Introduce visitor limits or reservation systems for heavily frequented trails, and consider implementing entrance fees to support conservation, habitat restoration, and research.

The TANAP Administration acknowledges the stated comment. During the oral hearing, the representative stated that the Administration does not possess relevant data that could be assessed and subsequently integrated into the management of tourist traffic on heavily frequented sections. He also noted that, at present, there is no consensus regarding the potential introduction of fees for certain hiking trails.

Jaroslav Solár

Critical commentary, fundamental comments, and requests for change

NAPANT – deficiencies and inappropriate zoning

The document Programme of Management for the Low Tatras National Park (NAPANT) and Its Buffer Zone for 2026–2055 contains several deficiencies, and the declaration of zones within NAPANT, as well as the changes to its boundaries and to the boundaries of its buffer zone, fail to comply with legislative requirements and do not adequately fulfil the international obligations of the Slovak Republic in the field of protection of habitats and species of European importance. One of the key comments concerned the extent to which transparency and verifiability of the underlying data were ensured when modifying the boundaries of the NAPANT buffer zone. In this comment, we stated: "The processor reduced the extent of the national park buffer zone without sufficient justification, while declaring that the area of NAPANT and its buffer zone was determined on the basis of a thorough study assessing the degree of naturalness of the environment. Since this study is not included among the supporting documents, we request that it be provided in order to allow an objective assessment of the legitimacy of the proposed changes."

Response of the NAPANT Administration and counter-arguments

In its response, the NAPANT Administration states that this is an internal analysis containing sensitive data, the disclosure of which could endanger protected species and habitats. However, such an explanation cannot be considered sufficient. Legislative processes leading to changes in the boundaries of protected areas require transparency and the possibility of expert review, at least with respect to methodology, evaluation criteria, and aggregated or synthetic outputs. The argument of protecting sensitive data cannot justify the complete exclusion of public and expert scrutiny from the decision-making process.

Particularly problematic is the fact that the reduction of the buffer zone is justified primarily by the presence of intensively managed agricultural land and municipal built-up areas. By definition, however, the buffer zone is not intended exclusively to protect "naturally preserved" areas, but rather to serve as a buffer mitigating external pressures on the core area of the national park. Without the presentation of relevant analytical documentation, it is impossible to assess whether the proposed reduction still fulfils this function.

Another major comment concerned the mismatch between the declared objectives of zoning and the actual spatial configuration of zones. In the introductory section of the document, the NAPANT Administration declares that one of the main objectives of zoning is to ensure the undisturbed course of natural processes on at least three quarters of the national park area, in accordance with § 30(3) of Act No. 543/2002 Coll. However, the proposed zoning shows that even the combined area of Zone A (non-intervention zone) and Zone B (zone directed towards non-intervention) does not reach this threshold and remains only slightly above 50%.

We therefore proposed that state-owned land in the Kráľoholská part of the national park (Malužinská Valley, Hodruša, Svarínska Valley, Nižný and Vyšný Chmelinec, Ipoltica, Ráztoky, Studená, Hošková, Driečna, Široká, Malinová, Medvedia, Horárska, the Dikula stream catchment and Vápenica) and in the Ďumbierska part of the park (Jasenská Valley – catchments of the Prostredný, Gelfusov, Jasenský and Čemošný streams, and Husarka), which are identified as state-owned in Map 6.4, be reassessed and, to the maximum extent possible, included in Zone A or, where appropriate, Zone B. Only in this way can the statutory requirements and declared conservation objectives be realistically achieved. In response, the NAPANT Administration argues that the legal provisions defining zones under § 30(4)(a) and (b) of Act No. 543/2002 Coll. are not strictly defined and have a recommendatory character. According to the Administration, zoning was carried out in accordance with Slovak and EU legislation and based on the occurrence of conservation targets—protected species and habitats of European and national importance. It further states that, at present or even over a time horizon of several decades, the objective of securing undisturbed natural processes on three quarters of the park area is unattainable and should therefore be understood as a goal or vision rather than a binding requirement.

Such an interpretation, however, weakens the normative force of the law and relativises its binding provisions. If the objective of protecting natural processes were to be understood merely as a loosely defined vision without clear spatial ambition, zoning would lose its strategic function. The proposed reassessment of extensive state-owned land in the Kráľoholská and Ďumbierska parts of the park was not motivated by an absolutist interpretation of legislation, but rather by an effort to align the declared conservation objectives with the actual spatial arrangement of zones. The fact that the NAPANT Administration partially accepted this comment while simultaneously allowing for individual reassessment of selected sites indicates that the

potential for expanding Zones A and B does exist, but has not yet been systematically utilised.

Within the Programme of Management for NAPANT and its buffer zone for 2026–2055, we also raised concerns regarding the risks associated with the ambiguous definition of management interventions in the habitats of the Western capercaillie (*Tetrao urogallus*). The comment addressed formulations in the ecological functional areas EFP2.1 and EFP2.2, where the forest stands considered to be potential capercaillie habitats are not defined with sufficient precision. This ambiguity creates room for broad interpretation, which may lead to the application of large-scale interventions in forest stands that could be misused for routine forestry activities, formally justified as "capercaillie protection". As a result, practices such as stand thinning, canopy opening, or small-scale logging (group shelterwood cutting or even clear-cutting of 0.2–0.5 ha) could be implemented at a scale incompatible with the objectives of nature conservation.

In its evaluation of comments, the NAPANT Administration states that this comment was partially accepted based on its expert assessment. It further specifies that potential capercaillie habitats may include former capercaillie sites with historically confirmed occurrence of the species, forest stands directly adjacent to functional capercaillie habitats, or forest complexes meeting the species' requirements, defined by bilberry cover on gentle slopes, in spruce and mixed forests at elevations above 800 m a.s.l. However, these criteria and basic ecological characteristics of potential habitats are not sufficiently operationalised within the document itself.

Without clear spatial delineation and binding management rules, there remains a risk that interventions such as thinning, canopy opening, or small-scale logging will be implemented in ways that conflict with the long-term conservation objectives for the species. The aim of the comment was not to question the need for active management in certain parts of the area, but rather to prevent its blanket and insufficiently controllable application. More precise specification of potential habitats would contribute to greater legal certainty, improved oversight of interventions, and better alignment between forestry management and conservation objectives. The evaluation of comments by the NAPANT Administration demonstrates an effort to respond to some of the raised issues, but at the same time reveals a fundamental tension between declared conservation objectives, legislative requirements, and the practical configuration of zoning and management measures. Without a higher degree of transparency, clearer interpretation of statutory provisions, and more precise definitions of management interventions, there is a risk that the Programme of Protection and Management will remain a largely formal document rather than an effective tool for safeguarding one of Slovakia's most important national parks.

TANAP – Comments on the Programme of Protection and Management of TANAP

One of the fundamental pillars of a scientifically sound nature protection document is **terminological accuracy** and the use of concepts that reflect **ecological reality** and **current scientific knowledge** of ecosystem functioning. In the submitted version of the Programme of Protection and Management of TANAP, however, the language and framing primarily draw on **production forestry**, not on **modern forest ecology**. As an illustration, the document states: "At present, some parts of TANAP are covered by even-aged spruce monocultures that are more threatened by windthrow and by outbreaks of forest pests. Wind and bark-beetle calamities (Alžbeta 2004 and Žofia 2014) caused large-scale deforestation." In the Tatras, so-called wind "calamities" and the bark beetle in question are not unusual phenomena; they are an age-old component of the gradual development of mountain forest ecosystems under local conditions. Moreover, it is not accurate to claim that wind disturbances and bark-beetle outbreaks caused extensive "deforestation": forest remained, although in a degradation phase. The deforestation occurred through human intervention that deliberately interrupted natural processes—via sanitary or "calamity" logging and salvage operations. A more adequate revision would be: "At present, some parts of TANAP are covered by even-aged spruce monocultures, and several major wind disturbances (e.g. Alžbeta 2004 and Žofia 2014), followed by bark-beetle proliferation, accelerated the degradation of these forest ecosystems." This should be complemented by noting that: "The natural post-disturbance development of these forest ecosystems after the latest wind events was altered by sanitary and salvage logging, contrary to IUCN recommendations."

TANAP Administration **accepted** this comment and committed to adjusting inappropriate terminology. This is crucial: it changes the interpretation of ecological dynamics in a core strategic document, shifting the Programme towards a conservation-based rather than production-based approach. It also strengthens the credibility of the document vis-à-vis the scientific community and international reviewers and may help prevent mis-justified interventions in the future.

A key comment concerned the **unclear and unbalanced formulation of TANAP's long-term goals.** Although not in direct conflict with the Nature and Landscape Protection Act, their **substantive wording weakens the priority of natural processes,** which is the primary mission of a national park. Long-term Goal 1 does not reflect the statutory requirement to secure natural processes on at least three quarters of the national park area. Without this explicit formulation, the main goal can be loosely interpreted as a compromise between protection and use. Long-term Goal 2 ("Ensure fulfilment of TANAP's main functions, chiefly the potential for sustainable use of forest and grassland habitats and suitable forms of recreation and tourism without negative effects on the park's conservation targets") shifts emphasis from protection of natural processes to use of the territory. This creates the impression that use is a co-equal aim of protection—which contradicts the structure of the law, where protection processes are primary and

use is secondary. To avoid doubt, we proposed to restate the goals as follows: Long-term Goal 1 to Main goal: Conserve natural processes and maintain or improve the status of habitats and species that are the conservation targets of TANAP on three quarters of the national park's area, thereby securing the integrity of TANAP as part of the European Natura 2000 network. Long-term Goal 2 to Secondary goal: Ensure that all sustainable uses of forest and grassland habitats and suitable forms of recreation and tourism in TANAP proceed exclusively in accordance with the Main goal. In this form, both goals are more consistent with the Nature and Landscape Protection Act and clearly declare TANAP's stance: protection is primary; use of the landscape is subordinate to protection. The Act explicitly defines (Section 19(2)) that the aim of a national park is the preservation or gradual restoration of natural ecosystems, including securing the undisturbed course of natural processes on at least three quarters of the park's area. This is a **precisely defined quantitative target** - not a "vision", preference, or recommendation. We must also recognise that sustainable use of forest and grassland habitats and the development of recreation and tourism in a national park are possible only insofar as they do not conflict with the legal conservation aim and do not endanger conservation targets. To meet legal requirements and international standards (IUCN Category II Protected Area), these goals must be **explicit, unambiguous, and gap-free.**

TANAP Administration stated the comment was **partially accepted,** indicating that the main goal would be adjusted. However, the extent of acceptance is unclear, leaving a risk that the documents will continue to be interpreted in favour of use over protection.

The programme's **proposed management** in several ecological-functional spaces is problematic. In Zone B, for **EFP9** (Forest habitats under special management) and **EFP8** (Forest habitats on waterlogged/soaked sites and peatlands under special management), it should be explicitly stated that, under close-to-nature management (Section 18(4) of the Forestry Act No. 326/2005), **only selection and purpose-oriented systems may be used**, and the shelterwood system should be entirely prohibited. Current legislation allows **shelterwood** even in protective forests and forests of special purpose, but shelterwood typically results in repeated area-based interventions that reduce non-production functions and, crucially, disrupt the continuity of natural processes. It also fails to provide space for spontaneous forest dynamics and does not create a permanently differentiated, vertically and horizontally diverse stand structure. If these habitats are intended to become Zone A and to fulfil the national park's goal, including securing undisturbed natural processes, any form of shelterwood is deeply concerning. Similarly, in sub-zone C1 of **EFP12**, close-to-nature management should be limited to selection and purpose-oriented systems. Beyond the ecological arguments, area-based interventions create a public perception, especially among visitors, that logging is taking place in a national park, the protection system is not functioning, and corruption exists.

TANAP Administration **did not accept** this comment, arguing: "The request goes beyond the Forestry Act. If shelterwood is applied sensitively, preparing or releasing natural regeneration, the approach is in line with principles of gentle habitat management. It is also essential to maintain appropriate timing and proper technological procedures." Notably, TANAP Administration refers to the Forestry Act, not the Nature Protection Act, which should be primary. "Sensitive application" is undefined in the document, creating interpretative risks. We are concerned that no criteria exist to control the scope of such interventions, leaving space for excessive operations that may reduce naturalness, fragment habitats, and slow the progression of Zone B towards non-intervention.

The draft care principles for **Zone A – Hunting** allow exceptions for harvesting ungulates and furbearers. The first principle's final sentence is problematic: "An exception for hunting ungulates and furbearers shall be granted for precisely defined localities and periods in the calendar year"; and the second principle states: "In EFP4, hunting of ungulates (except the Tatra chamois) is permitted outside the period from 15 October to 31 May." We must underline that Zone A is non-intervention; hunting is an active intervention in natural processes, whose preservation is the highest priority. Act 543/2002 prohibits capturing, killing, or hunting animals in areas under fifth-level protection.

TANAP Administration **did not accept** the comment and insisted on enabling hunting in Zone A, **as requested by non-state owners;** according to their position, allowing hunting is a **condition for inclusion of lands in Zone A.** While we understand owners' requests, such a compromise must not degrade the park's most valuable core. Hunting is an active intervention into population dynamics, behaviour, trophic relations, selection, and migration; the law prohibits hunting under Level 5 protection. Allowing hunting merely to "reach agreement" with part of the ownership base **weakens the park's legal target, creating a precedent** that others may exploit. Ultimately, this undermines national and international credibility (IUCN, Natura 2000) and may complicate EU financing tied to favourable conservation status. The park administration has a mandate to protect public interest and the statutory goal; conditioning Zone A classification on hunting permissions is not consistent with that mandate. There is scope for such **hunting partnerships in Zones B/C and in the buffer zone.** The administration could **reciprocally offer state-managed lands as hunting areas to non-state owners** who cannot hunt on their Zone A properties.

TANAP – Zone B – Forestry

In Zone B – Forestry, TANAP prefers a philosophy of **rapid processing of infested timber after wind disturbances and during bark-beetle**

outbreaks. The first principle uses common forestry terminology (e.g., staged regeneration, reconstruction), but these can lead to misinterpretations, suggesting that shelterwood elements may be applied in Zone B, which is inconsistent with the fifth principle, which supports selection/purpose-oriented approaches in regeneration. We suggest rephrasing to emphasise that regeneration should proceed via deliberate tending, gradual, close-to-nature renewal differentiated in time and space, using selection or purpose-oriented systems (species composition matched to site conditions, long or continuous regeneration period, target stand structure uneven-aged, horizontally and vertically differentiated, target canopy closure 0.6–0.7 (0.8)). This formulation stresses gentle, long-term, selection-based interventions, not area-based stages or reconstructions, and points to the overarching aim: gradually securing undisturbed natural processes. Regarding the second principle ("rapid processing of infested timber"), which reflects production logic, we emphasise that the bark beetle is a natural component of Tatras forest habitats. Gradations are a normal mechanism of forest dynamics, leading to opening of microsites, diversification, natural regeneration, and ultimately higher stability. "Rapid processing" replicates classic calamity management, often area-based. Fear of bark beetle primarily stems from loss of timber value, not from ecological logic. In Zone B, under close-to-nature management, the aim should be different, retain as much material as possible for natural processes and intervene only where there is real risk of mass spread into production forests or safety hazards. While the Forestry Act (Section 28) obliges managers to protect forests, including calamity processing, it would be desirable to align forestry legislation with the Nature Protection Act such that calamities need not be processed area-wide even under Level 4 protection, and the provision on purpose-oriented management can be used to limit interventions to local, minimal actions (e.g., at borders with production forests to prevent spread beyond the zone). We propose the following wording: "In the event of wind or other disturbances, the state of stands and bark-beetle occurrence shall be strictly monitored. If a high risk of mass proliferation or threat to stand stability is detected, it is permissible to remove only actively infested trees. Standing dry trees, broken trees, small-wood, and part of downed dry trees already vacated by bark beetle (non-attractive material) shall be left in place, at minimum 10 trees per hectare, in order to preserve natural processes and biodiversity."

TANAP Administration stated this comment on Zone B (Forestry) was **partially accepted** and that the definitions and procedures for Zones B and C would be adjusted. However, the response does not indicate whether the new wording will indeed eliminate area-based practices, shelterwood stages, or "rapid processing" as a default. Empirical data on post-calamity landscape impacts in the Tatras show that area-based interventions alter recovery trajectories (more fragmentation and erosion risk) compared to areas left to natural processes; ignoring this in a national park is scientifically untenable.

TANAP - Zone B – hunting

In Zone B – Hunting, if the real aim is the gradual transition of forest habitats from Zone B to Zone A, the first two hunting principles should be re-formulated. For example: Principle 1: Interventions in the natural population dynamics of game are permissible only where there is excessive damage to natural regeneration, threats to conservation goals and targets, and in line with the game management objectives and legal framework for the relevant hunting area. Principle 2: Feeding is allowed only in exceptional cases and exclusively in existing facilities; only food naturally available in the habitat may be used, to avoid introducing non-native/invasive species or disrupting food webs. Feeding cannot be a general rule, as it may artificially maintain high populations that threaten conservation targets. Gradually reducing the intensity of hunting interventions and especially feeding can stabilise populations at natural levels.

TANAP Administration **accepted** this comment and will re-evaluate care principles in Zone B. We consider this an important success: it explicitly acknowledges that game management in a national park should not be "routine practice", but a tool aligned with conservation objectives and measurable ecological criteria.

TANAP – zonation and state ownership

A **specific issue** is that the proposed TANAP zonation does not secure the basic conservation goal under Section 19(2) of Act 543/2002 Coll.—undisturbed natural processes on at least three quarters of the park. While we recognise the complexity of achieving this target given the positions of private landowners, there is no reason **why state-owned lands were not included in Zone A to the maximum extent**. Classifying state lands under a non-intervention regime would significantly move zonation towards the statutory target. We see the largest potential on state lands in forest stands currently assessed as lower-quality habitats, due to long-term management or disturbances (wind and subsequent bark-beetle outbreaks), where salvage logging was carried out. Experience from Poland shows that intensive interventions against bark beetle were largely ineffective; leaving such degraded habitats to spontaneous development appears more effective. On state lands, this approach is feasible, and economic benefits can be expected: active restoration is costly, and its long-term success, especially regarding future stand stability, is questionable. Moreover, human expectations of what a "natural" forest should look like may not align with natural succession and the real potential of the area. From a conservation perspective, it is therefore preferable to accept natural dynamics and support recovery via natural processes.

TANAP Administration **took note** of this comment. We welcome that the objection was registered; however, "taking note" **is insufficient** - without concrete steps and a timeline, the ¾ target remains unattainable. Ongoing discussions on the new zonation (and repeated procedural challenges)

confirm that without a clear priority for the non-intervention core and transparent analytical bases, progress will be slow.

From a conservation perspective, **zoning of Bielovodská and Javorová Valleys is non-conceptual and particularly problematic.** The forest habitats proposed for Zone B should logically be Zone A. A similar situation concerns forest habitats below Kýčera (1283 m a.s.l.) down to the Cesta slobody (Podspády). Zonation of habitats from Príslop (1214 m a.s.l.) and Strednica (1129 m a.s.l.) to PR Grapa should be at least Zone B, given state ownership and high natural potential. A striking anomaly is PR Goliašová (with Level 5 protection), classified only in Zone C, likely by mistake. Extensive habitats between PR Bór, PR Čikovská, and PR Pavlová are problematic: current Zone C classification fragments the landscape and weakens ecological connectivity among protected areas. A more rational solution would be Zone B at minimum. **Strong fragmentation** is also evident around Ždiar (localities Tokáreň at 1219 m a.s.l. and Javorinka at 1259 m a.s.l.). Ecologically, the entire upper catchment of Tokárenský Potok, now in Zone B, should be Zone A; and the proposed A zones should be connected at least via Zone B corridors to prevent isolation and support functional integrity. These lands are owned by the Town of Spišská Belá and managed by Municipal Forests Spišská Belá. Although not state ownership, they are public ownership, whose management should serve a broader public interest. Including these forests in Zone A would not only strengthen the continuity of non-intervention areas, but also support long-term appreciation of natural process protection and ecological connectivity within TANAP. A similar valley-complex disconnect occurs in Seven Springs Valley (from the confluence with Milý Potok up to 1213 m a.s.l.) and in Kežmarská Biela Voda Valley: Zone B at Šalviový Spring, Mt. Rinas (1473 m a.s.l.), and Stežka (1530 m a.s.l.) should be Zone A.

TANAP Administration **partially accepted** the comment and stated: the original zonation around Tatranská Javorina was based on a requirement for continuous interventions in forest stands (salvage logging, intense tending of young stands). After re-assessment, TANAP Administration now classifies Bielovodská Valley, except mown meadows, as Zone A. Likewise, Javorová Valley is placed under passive management, except meadows around Podmuráň and higher-elevation young stands; these are assigned to Zone B to carry out tending supporting valuable broadleaves and fir, after which the locality will be reclassified to non-intervention. In Javorinská Široká, stands at Suchá and Široká Poľana are assigned to Zone A; other young stands require one to two tending interventions, after which they will also be placed in Zone A. Around Biela Voda stream, stands are also reclassified to Zone A. The remaining parts at Vyšná/ Nižná Chovancová are assigned to Zone B, with the aim of improving capercaillie habitats; after these measures the stands will be reclassified to Zone A.

We consider this partial acceptance a significant step towards a more coherent core in the Tatras valleys; yet it remains largely **local corrections, not a systemic solution of connectivity** along TANAP's northern margin (Ždiar – Tokáreň – Javorinka) and other nodes where isolation of A islands persists. The park's core must protect processes in "wholes", not just islands: isolated A patches face strong edge effects (wind, visitation, game), which degrade conservation targets.

TANAP – Western Tatra mountains

The **proposed Západné Tatry (Western Tatra) zonation conflicts with the basic goals** of the national park and directly threatens conservation targets, as entire complexes of exceptionally valuable habitats, from alpine to montane, are assigned only to Zone C. This solution fails to account for the area's ecological value and the need to secure undisturbed natural processes across most of the park's area, as expected by IUCN principles and Slovak legislation. It is evident that the current proposal significantly reflects the **disagreement of some owners or their representatives,** who view zonation primarily through the lens of short-term economic gains or future development potential. Such an approach directly contradicts the purpose of a national park, whose mission is the protection of natural heritage as a societal value. We therefore requested that these habitat complexes be classified at minimum as Zone B, and the most valuable parts directly as Zone A, thus fulfilling TANAP's mission in the true sense of a national park.

TANAP Administration **took note** of this comment, and argued that zonation was prepared respecting non-state owners' demands. In practice, this gives decisive weight to the economic preferences of a minority (urbar/ landowners communities) over public interest and Slovakia's international obligations. Such zonation does not stand on scientific or legal grounds. Respect for owners is important, but it must not trump core protection in the national park. The park administration manages public interest; in a conflict with short-term economic preferences, the protection mandate must prevail. Current public debate on TANAP's zonation repeatedly highlights contentious perceptions, both of zonation and of nature protection itself, which also reveals that **the park is not the economically strongest actor in the region. The negotiation and implementation framework for engagement with non-state owners has been underestimated**, and non-state owners (or their representatives) do not realise the benefits of zonation. Zone A or B does not mean "loss of control or income"; it provides certainty, lower costs, reduced risks, and new revenue streams that are, especially in mountain forests, often more sustainable than chasing short-term timber production.

Non-state owners can derive **economic and practical benefits** from Zone A (core non-intervention) and Zone B (low-intervention close-to-nature regime): stable income (contracted financial compensation; potential payments for ecosystem services), diversified revenues (contracted habitat care, national management schemes, LIFE/EU projects), lower costs (cultivation, reduced logging/ stand-restoration burdens), lower risks (fewer legal

disputes, unpaid invoices, timber fraud; reduced erosion/degradation; better ownership reputation), and potential for ecotourism and branding (guiding, accommodation, product lines with quality labels, ecological or nature-friendly). Frankly: logging in a national park makes sense only as a precise, low-intervention operation, selection or purpose-oriented, producing wood and products with a seal of origin ("clear quality label"), commanding higher market price and better reputation. The shared interest of non-state owners should be **a strong, economically prosperous national park** that can long-term compensate non-intervention or low-intervention regimes with higher and stable payments, and, ultimately, help people in the region earn more through a joint quality brand.

Tatiana Pitoňáková

Critical commentary, fundamental comments, and requests for change

NAPANT – Management and building constructions

The Management Plan of the Low Tatras National Park (NAPANT) and its buffer zone represents a key strategic document aimed at defining the boundaries of the national park, establishing zoning, and setting long-term conservation objectives. Among the main declared goals is the preservation or gradual restoration of natural ecosystems and the assurance of undisturbed natural processes on at least three quarters of the national park's territory. However, in several parts of the proposed zoning scheme, these objectives encounter practical contradictions, particularly due to the fragmentation of the territory and the insertion of lower protection zones into otherwise continuous areas of higher protection. Such subdivision can disrupt ecological continuity, reduce the ability of ecosystems to respond to environmental change, and lead to biodiversity loss, especially for species that require large, unfragmented habitats. This issue is of particular importance because the affected areas are also part of Special Protection Areas for birds and Sites of Community Importance within the Natura 2000 network, which further emphasizes the need to maintain territorial integrity and a high level of protection. For this reason, it appears justified to merge adjacent Zones A and B into larger continuous units without reducing the level of protection, in order to effectively fulfil conservation objectives.

The concept of ecological-functional units proposed in the management plan also raises concerns, as their delineation does not always correspond to real environmental conditions. In particular, the area between Chopok and Ďumbier is classified as a single category of alpine grassland left to spontaneous development, although it represents a large and ecologically heterogeneous territory above the dwarf pine belt with significant altitudinal and habitat diversity. Such simplified classification is not sufficiently precise and may lead to inappropriate management decisions. Accurate and realistic mapping of ecological-functional units based on the actual state of the territory is therefore a necessary prerequisite for informed decision-making regarding conservation and land use.

Questions also arise regarding the regulation of existing buildings in the strictly protected Zone A. Although the management plan specifies conditions for their maintenance, it does not clearly define their functions, which may result in conflicts between nature conservation objectives and development interests. A clear designation of the purpose and regime of existing structures is essential to prevent interpretative ambiguities and future disputes. At the same time, Zone A allows the culling of certain animal species, the spot application of chemical agents for the protection of young forest stands, and the operation of hunting facilities such as feeding sites. These measures constitute interventions in natural processes that should be left to spontaneous development in the core areas of the national park. Their application should therefore be precisely specified in terms of conditions, extent, timing, and responsible authorities, in order to avoid weakening the protection regime.

In Zone C, clearly defined rules for existing buildings are lacking, which creates room for ambiguous interpretation and potential expansion of construction. The introduction of precise regulations for the management of existing structures and explicit prohibitions on new buildings would significantly contribute to the stability and predictability of the protection regime. Similarly, in Zone D, where tourist-oriented construction is permitted, it is necessary to consider both planned and actual visitor numbers and to adjust the capacity of wastewater treatment plants and sanitary infrastructure accordingly. Insufficient technical facilities may lead to environmental pollution, disturbance of aquatic ecosystems, and degradation of habitats in the surroundings of heavily visited tourist facilities.

A serious problem is also the quality of data concerning the status of plant and animal species. Assessments are often based on estimates or data with a wide margin of uncertainty, and the time period of data collection is not always specified. Without accurate and up-to-date information, it is not possible to develop effective management plans or to objectively evaluate the conservation status of protected features. Systematic monitoring of species and habitats should therefore form the foundation for further decisions on zoning and conservation measures.

The Management Plan of the Low Tatras National Park represents an important step towards the systematic conservation of this extensive mountain area; however, in its current form it shows several inconsistencies between declared objectives and proposed measures. The preservation of large, continuous non-intervention areas, more precise delineation of ecological-functional units, clear regulation of buildings, consistent solutions for wastewater management, and strengthened monitoring of species and habitats are essential prerequisites for maintaining ecological integrity. Only under these conditions can the Low Tatras National Park fulfil its role as a core area of nature conservation within Slovakia and the European Natura 2000 network and ensure the long-term preservation of

natural processes in one of the most significant mountain ranges of the Carpathians.

TANAP – Zoning, NATURA 2000, valuable valleys

The project for the protection of the Tatra National Park and its buffer zone (SKUEV0307 Tatry) is a fundamental conceptual document for the long-term direction of protection of one of Slovakia's most important protected areas, which is also a key part of the European Natura 2000 network. The Tatras site of European importance overlaps with the territory of TANAP in most of its area, which places high demands on the consistent preservation of natural processes, the favorable condition of habitats, and the ecological integrity of the landscape. The declared objectives of the conservation project are to preserve or improve the condition of habitats and species of European importance, but some of the proposed measures and zoning methods raise doubts about their compliance with the principles of non-intervention conservation and long-term sustainability of the area.

Particularly problematic is the issue of management rules for Zone A, which is defined as a strictly non-intervention area with priority given to the preservation of natural processes. However, the protection project allows, in certain cases, exemptions for hunting of ungulates and fur-bearing game in specifically designated localities and time periods. Such an approach contradicts the very essence of a non-intervention regime, since hunting represents a direct interference with population dynamics and disrupts natural regulatory mechanisms within ecosystems. This creates a discrepancy between the objective of preserving natural processes and the practical measures that actively modify them. Maintaining Zone A as a truly non-intervention area is a fundamental prerequisite for long-term research on natural ecosystem dynamics and for fulfilling conservation objectives arising from the inclusion of the area in the Natura 2000 network.

The protection project also addresses the alpine and subnival vegetation belts, stating that human impact and the level of threat are lowest there compared with other zones. This conclusion is questionable, as the document itself simultaneously describes several forms of anthropogenic pressure, especially due to intensive tourism and non-compliance with designated hiking routes. In the extreme conditions of high-mountain environments, human disturbances have more pronounced and long-lasting effects than in lower altitudes because soil and vegetation regeneration is significantly slower. Trampling of protected plant communities, soil erosion, and disturbance of microhabitats lead to a deterioration of habitats that are subject to protection at both national and European levels. Describing human impact as "minimal" may therefore result in an underestimation of real risks and insufficient protective measures in the most sensitive parts of the territory.

The proposed zoning itself also raises important questions, particularly in relation to state-owned areas with high natural value. In some localities, such as the Bielovodská and Javorová Valleys, the zoning structure appears inconsistent and ecologically problematic. Given their natural potential and ownership status, these areas should be prioritised for inclusion in Zone A in order to ensure continuity of natural processes and maintain the integrity of large ecological units. Similarly controversial is the reclassification of certain areas that currently have the highest level of protection into lower protection zones, as in the case of the Goliášová Nature Reserve. Such an approach weakens the protection regime of sites that were previously identified as highly valuable and may lead to their gradual fragmentation. Connections between individual zones should be smooth and should respect ecological relationships between neighbouring areas, rather than creating sharp transitions between markedly different management regimes.

Tourism and related infrastructure constitute another critical issue. Although the protection project declares the principle of not expanding ski slopes and built-up areas and allows modernisation only within existing facilities, it does not establish sufficiently clear criteria for assessing the environmental impacts of such modernisation. Noise, habitat fragmentation, deforestation, and soil erosion are among the main factors that can significantly affect the ecological stability of the area. Furthermore, the project does not explicitly incorporate obligations for operators of recreational and tourist facilities in the fields of hygiene, waste management, and wastewater treatment. In heavily visited parts of the Tatra National Park, problems associated with littering and pollution are accumulating, negatively affecting not only the aesthetic value of the landscape but also the quality of habitats and water resources. Preventive planning of hygienic infrastructure is therefore essential in view of the increasing number of visitors and growing pressure on the most attractive parts of the park.

The protection project also pays only marginal attention to climate change, despite the fact that high-mountain ecosystems are among the most sensitive to changes in temperature and precipitation regimes. The absence of concrete adaptation measures and a systematic monitoring framework for habitats and species represents a serious shortcoming, as without regular data collection and evaluation it is impossible to objectively assess the conservation status of protected features or the effectiveness of implemented measures. Publicly accessible monitoring data would also enhance transparency in decision-making processes and allow greater involvement of both the scientific community and the general public in evaluating the development of the area.

An important aspect of future management of the Tatra National Park is the role of local communities. Greater participation of municipalities and local inhabitants in decision-making processes can contribute to harmonising nature conservation with local development, promoting ecotourism, traditional forms of land use, and local products instead of mass tourism. At the same time, it is necessary to design a financing mechanism linked to ecosystem services, whereby a portion of tourism-related revenues would be directed directly to trail maintenance, hygienic facilities, and nature monitoring. The principle of "the polluter

pays" would thus ensure that investors and operators of tourist facilities bear an appropriate share of responsibility for the environmental impacts of their activities.

Although the Protection Project of the Tatra National Park represents an important step towards systematic management of the territory, its current form contains several inconsistencies between declared conservation objectives and proposed measures. To preserve the integrity of the area as part of the Natura 2000 network, it is essential to strictly apply the non-intervention regime in Zone A, to reconsider the zoning of ecologically valuable localities, to strengthen monitoring of habitats and species, to clearly define rules for tourist infrastructure, and to more strongly incorporate climate change adaptation measures. Only under these conditions can the long-term protection of natural processes be ensured in one of the most valuable mountain regions of Central Europe.

Martin Janiga

Critical commentary, fundamental comments, and requests for change

TANAP – Maps of habitats

The TANAP Care Program is a serious document that will serve as the basis for future Slovak government regulations. However, it has been drafted in a superficial manner. For example: It does not specify the exact locations of protected subjects, such as biotopes, biotopes of European importance, and forest communities.

The TANAP administration argued that „the submitted map of biotope complexes is generalized and serves mainly for orientation purposes".

TANAP – Rare and old trees

Rare and old trees can have exceptional reproductive and genetic value. However, within forest complexes covered by forestry legislation, their individual uniqueness is often overlooked, making them susceptible to planned or random logging. These forests contain older and original trees with high ecological, regenerative, and recreational value, which is often higher than that of trees in areas near villages. One example is a network of fir trees stretching from the Tatra Basin to Bachledova Valley and, in some places, to Tatranská Javorina. In addition to white firs, there are also rare old mountain maples and beeches. Beeches can be found along the road to Lysá Poľana. Logging also takes place in inaccessible areas such as Javorová Valley, specifically above Kubalová. There, a huge gash has been made even though there are very old, original maples. Behind St. Anne's Church, there is a highly valuable forest with very old beeches and other tree species. Behind the forest, there are small lakes with original populations of Carpathian and Alpine newts, which are also the subject of the Care Program. Given the above, I suggest that all plots in the Javorová and Bielovodská valleys, which were proposed for zones B and C, be reclassified as zone A.

Response from the TANAP Administration

The TANAP Administration does not agree with the above request. Individual protection of old and significant trees can be ensured in Zones B and C. We (IHMB – M. Janiga) answer that protection of trees in Zones B and C is weaker because they are not specially marked and are subject to local logging.

TANAP – Socioeconomic value of the National Park

The authors of the Care Program approached the task of the TANAP Biosphere Reserve very formally by listing monuments and folk architecture reserves in a table, without attempting to engage more deeply with the region. Example: In the case of Ždiar, monuments and folk architecture reserves are only mentioned in one sentence. The national park should be more interested in this issue, especially since it is also a Biosphere Reserve. Current trends in construction of buildings ruin the overall character of the original architecture in favor of cottages, guesthouses, skiers, and tourism. Clearly, there is a double standard in the evaluation of heritage conservationists. Annual mowing and mulching in the heritage area does not benefit the traditional meadow cultures; perhaps mowing once every four to five years would suffice (as in former four-field farming). Mowing often takes place without the owners' consent, and sometimes the hay just rots in storage. I see this as a flawed policy of the Agricultural Agency (PPA), which cooperates little with the national park. Meadow communities provide habitats for many protected species, including the corncrake, quail, partridge, songbirds, amphibians, and blindworms. If the Care Program already includes a list of folk architecture monuments, then it would be appropriate to update the program to include TANAP's connection to these monuments.

TANAP – Water resources

After communicating with the landowners, it is still unclear how the permit for the linear construction of snowmaking facilities on the ski slope in Bachledova Valley was obtained and if the impact on the flow of the Javorinka River was realistically assessed for the increased water intake up to Bachledova Valley. Clearly, there will be less and less snow, and more and more water will be pumped. Although the minimum flows proposed in the Care Program are in place, the flows are only measured at one point. The meanders and bends that are essential to the river's ecosystem may dry up permanently. To protect water resources, the Care Program must propose measures to reduce pollution from local discharge pipes at certain times of the year. I propose including more detailed information in the Management Program on how and within what time frame water resources will be managed.

The TANAP Administration has taken note of this comment.

TANAP – Environmental land

The idea that part of Slovakia's land fund should be designated as environmental land, apart from forest and agricultural land, has long been discussed in scientific circles. Where else but in a document called the National Park Care Program should this concept appear? The document outlines the program's vision. Such a framework would also provide space to systematically address issues of damage and compensation for non-state landowners, farmers, and land-owning communities. Under this concept, Zone A would be left to develop through natural processes. The absence of such an approach is one of the reasons why traditional herbal habitats and medicinal plant resources are declining today, often at the expense of intensive agriculture. At the same time, large-scale losses of pollinators, including bee colonies, are being observed. This solution would contribute to a better balance of water resources, cool the soil, and help flora's transpiration potential, even during floods. I request that the **environmental land vision be incorporated into the TANAP Care Programme.**

TANAP – touristics, economy

Unlike many other countries, Slovakia does not have a reimbursement relationship between private companies' use of national parks and the National Park Administration. The National Park Administration is required by law to protect natural beauty. For example: Mountain chalets have an interesting annual income, and their monopoly in the valley is linked to nature conservation. What do the chalets pay the national park for this, though? In our case, nothing. I demand that the Care Program at least address this issue, and compare it to other parks in Europe.

Free access to nature outside tourist trails. I believe that if the National Park Administration does not have the capacity to control this clientele, which it does not have today, such access should only be allowed in exceptional cases. Otherwise, the Nature Conservation Act is being violated. This position should also be stated in the Management Plan.

The TANAP administration responded that they did not agree with the idea of allowing free movement within TANAP territory.

Lenka Zábojníková

NAPANT, partial comments

Page 89 of the management programme states that special emphasis is placed on the collection and disposal of dead game. It is not specified whether this refers to game that has been shot or has died naturally, or in which area. In Zones A, B, and C, it is not desirable to remove dead game, as it is a natural food source for scavengers, including brown bears. Its widespread removal will lead to a higher degree of synanthropization, as bears will be forced to look for food elsewhere. The removal of carcasses is only desirable in places where there is a risk of bears encountering tourists/local residents, near settlements, tourist trails, and tourist infrastructure facilities.

Page 104 describes the activity Completion and commissioning of fish passes around small hydropower plants operating on watercourses. The description further states that the national park administration, landowners, and land managers are to take responsibility for the activity. The activity will be financed from EU funds, the state budget, and own resources. It is not stated that this activity should be financed by the operators of the small hydropower plants themselves. Section 38(11) of Act 24/2006 on environmental impact assessment states that "if priority habitats or priority species are present in the area concerned, the proposed activity may only be authorized for urgent reasons of overriding public interest relating to public health, public safety, or beneficial consequences of fundamental importance to the environment, or if, according to the opinion of the European Commission, the proposed activity is related to other urgent reasons of overriding public interest and subject to the imposition of compensatory measures in accordance with a special regulation." The construction of functional fishways should have been part of the compensatory measures already in the process of assessing small hydropower plants. Section 28 of Act 543/2002 states that in areas of the European Natura 2000 network of protected areas, compensatory measures shall be implemented at the expense of the proponent. However, during the construction of small hydropower plants, environmental impact assessment legislation was set up differently, so that many small hydropower plants were not subject to assessment or investigation. Therefore, it is now impossible to require SHP operators to contribute to the financing of the construction of functional fish passes on watercourses.

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