



WWF

REPORT

2018

PROTECTING PIRIN FROM UNSUSTAINABLE  
SKI EXPANSION AND LOGGING

# SLIPPERY SLOPES

A REPORT FOR WWF BY

Dalberg

## ACKNOWLEDGEMENTS

The report was written by Dalberg Advisors, and the team comprised Wijnand de Wit, Alexander Hazen, Ellie Marsh and Anders Kjemtrup.

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## WWF

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WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption

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# CONTENTS

## CONTENTS

<b>CALL TO ACTION</b>	<b>4</b>
<b>EXECUTIVE SUMMARY</b>	<b>8</b>
<b>THE VALUE:</b> <b>PIRIN NATIONAL PARK PROVIDES SUBSTANTIAL ENVIRONMENTAL, ECONOMIC, AND SOCIAL BENEFITS FOR LOCAL COMMUNITIES, BULGARIA AND THE WORLD</b>	<b>10</b>
<b>THE THREATS:</b> <b>FURTHER SKI INFRASTRUCTURE DEVELOPMENT AND UNSUSTAINABLE MANAGEMENT THREATEN PIRIN'S ENVIRONMENTAL, ECONOMIC, AND SOCIAL VALUES</b>	<b>12</b>
<b>IN FOCUS:</b> <b>ASSUMPTIONS UNDERLYING THE BUSINESS CASE FOR SKI EXPANSION ARE WEAK. A GAMBLE WITH POOR ODDS</b>	<b>22</b>
<b>THE SOLUTION:</b> <b>FOUR CONCRETE STEPS TO CREATE A SUSTAINABLE FUTURE FOR PIRIN</b>	<b>24</b>
<b>CONCLUSION:</b> <b>PIRIN AND THE PRINCIPLES FOR SUSTAINABLE DEVELOPMENT OF WORLD HERITAGE SITES</b>	<b>30</b>

# WWF'S CALL FOR COLLECTIVE GLOBAL ACTION

**Bulgaria's Pirin National Park is a unique ecosystem and one of Europe's most important biodiversity hotspots. Pirin provides vital resources to 130,000 people in local municipalities and generates an annual economic value for the region estimated at up to €69 million.**

**Today, Pirin is at a crossroads. Construction and expansion of ski facilities that pursue short-term gains have damaged Pirin's ecosystems and compromised the long-term economic benefits provided by the park. The existing construction has resulted in the exclusion of a portion of the park from the overlapping World Heritage site. A new draft management plan and recent amendments to the current management plan would allow further construction and logging inside the World Heritage site. The proposed plan could cause irreversible damage to the park's *outstanding universal value*.**

Immediate action is needed to save Pirin. A draft of the new management plan is being disputed in Bulgarian court and amendments to the current management plan were approved in late December 2017. There is an opportunity to replace the new draft management plan and the latest amendments with a more sustainable plan that will ensure the site's long-term protection. The Bulgarian government should work with regional authorities, private sector entities, scientific institutions and civil society groups to develop a new management plan to ensure that it respects Pirin's social, environmental and economic values and focuses on long-term sustainable tourism.

If all stakeholders work together, Pirin's unique value can be safeguarded for current and future generations, and the park can be a driver of sustainable development in southwestern Bulgaria. Pirin could also serve as an example for other protected mountain areas, and demonstrate how such areas can simultaneously provide environmental protection, support local communities, and enable sustainable sport and recreational activities where possible. However, failure to act could result in Pirin being inscribed on the List of World Heritage in Danger, and eventual complete loss of its *outstanding universal value*.

## **WWF CALLS ON THE BULGARIAN GOVERNMENT TO PROTECT PIRIN NATIONAL PARK AND TO STOP HARMFUL CONSTRUCTION INSIDE THE WORLD HERITAGE SITE. SPECIFICALLY, IT MUST:**

- Enforce the national laws, European nature directives and international treaties that protect Pirin National Park;
- Forbid any further ski facility expansions, or other construction, inside the park;
- Reject the draft management plan, and develop a new plan based on independent strategic environmental assessments that incorporates thorough impact and opportunity assessments.

## **WWF CALLS ON INTERNATIONAL INSTITUTIONS TO TAKE ALL NECESSARY ACTIONS TO PROTECT PIRIN, AND REQUESTS:**

- World Heritage Committee members to initiate the procedure to inscribe Pirin on UNESCO's List of World Heritage in Danger, if the existing draft management plan is approved or if harmful construction projects are commenced;
- The European Commission to enforce the implementation of the Habitats Directive, and not to fund any activities that could further harm Pirin.

## **WWF CALLS ON THE INTERNATIONAL SKI FEDERATION, SKI GOVERNING BODIES AND SKI EVENT ORGANIZERS TO STRENGTHEN ENVIRONMENTAL PROTECTION MEASURES, AND TO:**

- Ensure the outstanding universal value of natural World Heritage sites around the world is not compromised by ski-related activities, events and developments;
- Exclude the Bansko ski resort from the venues hosting international ski events, if additional ski infrastructure is built inside the national park against Bulgarian legislation and UNESCO World Heritage Committee decisions.

## **WWF CALLS ON YULEN AD AND OTHER POTENTIAL CONCESSIONAIRES TO WITHDRAW FROM ALL ACTIVITIES THAT THREATEN PIRIN'S LONG-TERM ENVIRONMENTAL, ECONOMIC AND/OR SOCIAL VALUE, AND TO:**

- Refrain from investing in construction or logging projects inside the national park;
- Invest in sustainable and year-round tourism and income-diversifying activities that benefit local communities;
- Publicly commit to withdraw and refrain from any activities or construction in all World Heritage sites and buffer zones.

## **WWF CALLS ON CIVIL SOCIETY GROUPS AND NON-GOVERNMENTAL ORGANIZATIONS TO PROTECT OUR SHARED HERITAGE, AND TO:**

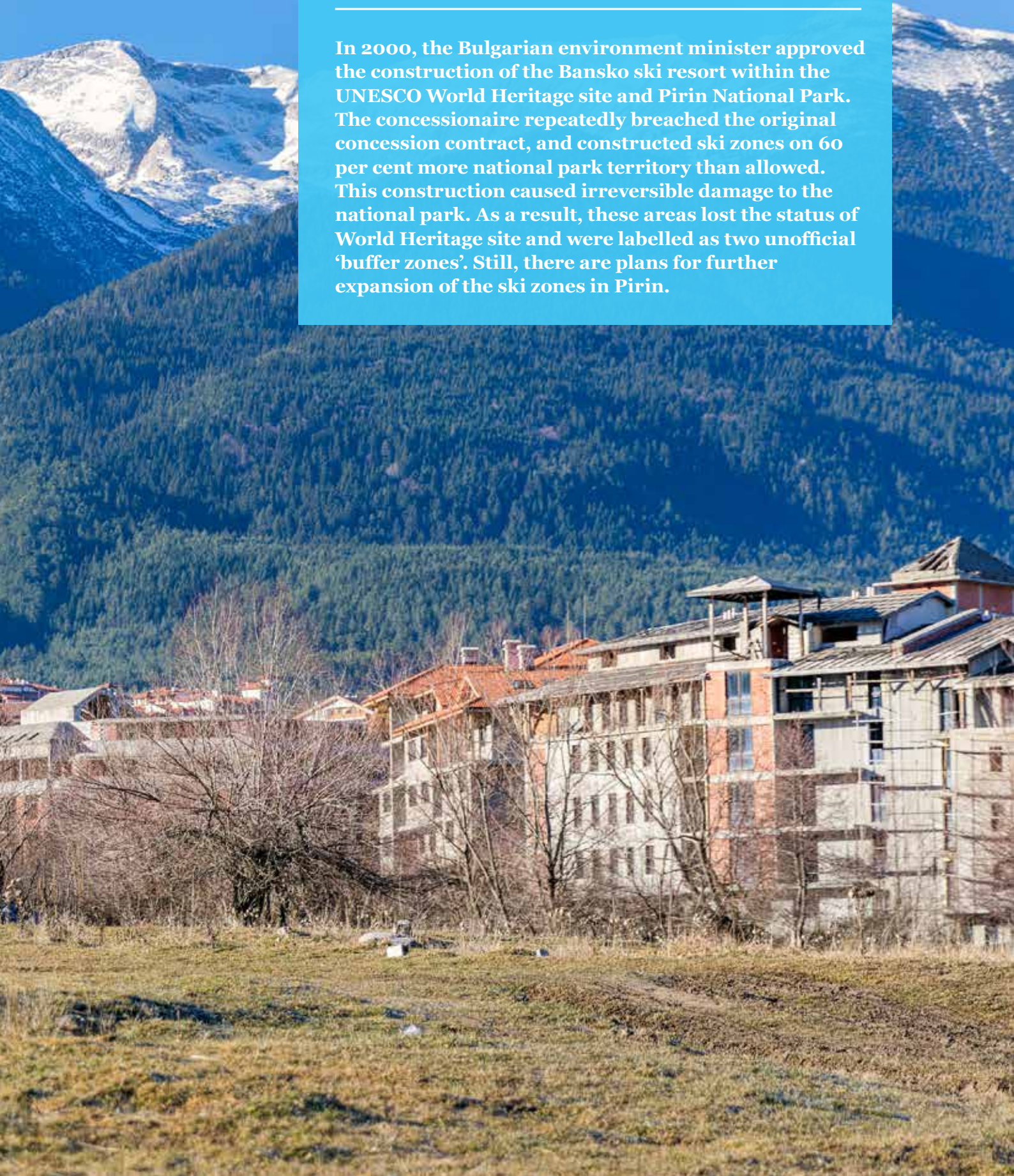
- Support the development of a sustainable management plan for Pirin;
- Hold accountable national and local decision-makers for the implementation of sustainable development activities in and around Pirin.



# A GAMBLE WITH POOR ODDS

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In 2000, the Bulgarian environment minister approved the construction of the Bansko ski resort within the UNESCO World Heritage site and Pirin National Park. The concessionaire repeatedly breached the original concession contract, and constructed ski zones on 60 per cent more national park territory than allowed. This construction caused irreversible damage to the national park. As a result, these areas lost the status of World Heritage site and were labelled as two unofficial 'buffer zones'. Still, there are plans for further expansion of the ski zones in Pirin.



# EXECUTIVE SUMMARY

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**PIRIN NATIONAL PARK IS A SITE OF OUTSTANDING UNIVERSAL VALUE AND GENERATES A TOTAL ECONOMIC VALUE ESTIMATED AT UP TO €69 MILLION ANNUALLY.**

The park is located in the Pirin mountain range of southwest Bulgaria and was inscribed as a UNESCO World Heritage site for its exceptional ecology, geology and beauty. Pirin is also part of the European Union's Natura 2000 network of protected areas, and

its ecosystem contains more than 1,300 plant species, 45 mammal species and more than 150 bird species. Pirin generates economic value through ecosystem services and sustainable tourism activities. The annual economic value is estimated at €69 million, equivalent to the annual income of close to 10,000 Bulgarian households.

**Construction of ski infrastructure in pursuit of short-term gains has damaged Pirin's environment and compromised its long-term socio-economic value.** In 2000, the Bulgarian environment minister approved the construction of the Bansko ski resort within the UNESCO World Heritage site. Yulen AD, the concessionaire, repeatedly breached the original concession contract, and constructed ski zones on 60 per cent more national park territory than allowed. This construction caused irreversible damage to the national park. As a result, these areas lost the status of World Heritage site and were labelled as two unofficial 'buffer zones'.

**A new draft of the park's management plan and amendments to the current plan risk further deteriorating the park's ecosystem.** A new draft management plan would allow construction of ski infrastructure in an area 12.5 times bigger than the current area and logging in 60 per cent of the national park. In March 2017, the Ministry of Environment and Water decided that this new draft management plan did not require a strategic environmental assessment, ignoring the Bulgarian Environmental Protection Act and the Biodiversity Conservation Act. At the time of writing this report, the ministry's decision is under dispute in court. While awaiting the court decision, the Bansko municipality requested amendments to the current management plan, which were approved in late December 2017. The amendments extend the ski construction area from the original 0.6 per cent to 2.8 per cent of the national park. The amendments also allow construction activities on 45.2 per cent of the park's surface, in areas dedicated to ecosystem conservation and recreation.

**The draft management plan and the amendments to the current plan facilitate further expansion of ski infrastructure, but the business case is weak.** The main argument supporting ski zone expansion is that the region needs to fully exploit its economic potential, and it can only do so by growing its ski industry. However, the ski zones have had mixed economic impact on the local economy to date, as demonstrated by increased unemployment, population reduction and drastic decrease of property value. Bansko is also not maximizing the potential of its existing facilities. Compared to other European ski resorts, Bansko attracts up to three times fewer ski visitors in proportion to its ski lift capacity, and has five times more beds per ski visitor. In addition, climate change is expected to affect snow conditions, increasing dependency on artificial snow. The use of artificial snow will inflate the cost of operating the ski resort and put pressure on the local water supplies.

**Expanding the ski infrastructure is not necessary, and sensitive use of existing facilities combined with sustainable economic development can better capture the long-term potential of the park.** Ski infrastructure



development has to be limited to increasing the quality and safety of existing facilities to secure visitor retention and better utilize the available capacity. Investors can then focus on extending the tourism offering beyond skiing by developing year-round activities to attract more visitors in spring, summer and autumn months. Potential opportunities include wildlife tours and guided hiking tours; increasing hotel utilization through business conferences and spa and wellness tourism; and utilizing the current ski facilities and forest roads in the summer for mountain biking opportunities.

**To safeguard this value and create a sustainable future for Pirin, the Bulgarian government, with support from all stakeholders involved, should take four steps:**

- (1) Reject the draft management plan and abolish the amendments to the current plan due to their threats to Pirin National Park;
- (2) Conduct strategic assessments and feasibility studies to understand opportunities and risks of any development in the area;
- (3) Identify and incorporate alternative income opportunities in a year-round sustainable tourism and income diversification strategy for the area; and
- (4) Develop a new management plan to reflect the joint commitment of all stakeholders to a sustainable Pirin.

In the future, decision-makers must refer to the principles of sustainable development of World Heritage sites to achieve an equitable balance between conservation, sustainability and development.

If stakeholders fail to cooperate and the draft management plan is approved in its current form, or the amendments to the current plan lead to harmful construction projects, Pirin could be inscribed on the List of World Heritage in Danger as a consequence of the irreversible damage to its *outstanding universal value*.

If successful, Pirin could serve as a blueprint for sustainable management of mountain ecosystems in Bulgaria and beyond, and its *outstanding universal value* would be protected for current and future generations.

*Heavy machines have been used in Bansko ski zone construction and maintenance*



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# THE VALUE:

## PIRIN NATIONAL PARK PROVIDES SUBSTANTIAL ENVIRONMENTAL, ECONOMIC AND SOCIAL BENEFITS FOR LOCAL COMMUNITIES, BULGARIA AND THE WORLD

**Pirin National Park is a unique and diverse ecosystem that includes a World Heritage site and is part of the European Union's Natura 2000 network of protected areas.**<sup>1</sup> The park is situated in the Pirin mountain range of southwestern Bulgaria. It was established in 1962 and covers an area of 40,000 hectares, which is equivalent in size to the Caribbean island of Barbados.<sup>2,3</sup> Pirin's diverse limestone mountain landscapes are dotted with glacial lakes, waterfalls, caves and forests. In recognition of its exceptional ecology, geology and beauty, the park was inscribed as a UNESCO World Heritage site in 1983.<sup>4</sup> Pirin also includes two Natura 2000 sites, placing it within the network of Europe's most valuable habitats for threatened species.<sup>5</sup>

**Pirin's ecosystem contains more than 1,300 plant species, 45 mammal species and more than 150 bird species, making it one of Europe's top biodiversity hotspots.**<sup>6</sup> Pirin supports approximately one-third of the country's flora diversity, including more than 40 plant species that are found only in Bulgaria.<sup>7</sup> Many iconic and rare wild animals can be found in the park, including the brown bear, grey wolf and lesser spotted eagle.<sup>8</sup> Pirin is also home to a third of Bulgaria's bird species, many of which are listed as Species of European Conservation Concern.<sup>9</sup> Eight amphibian species, eleven reptile species and six fish species are also found there.<sup>10</sup> About 60 per cent of the national park is covered by forest, which includes Bulgaria's oldest pine tree, the 1,300 year old Baikushev's Pine.<sup>11</sup> Pirin is known among scientists for being one of the few places in the world where endemic forests of *Pinus peuce* and *Pinus heldreichii* have survived.<sup>12</sup> These forests are the last habitat for a great number of rare and endemic plant, fungi and animal species.<sup>13</sup> The highest point in Pirin is Vihren at 2,914 metres, which is the second-highest peak in Bulgaria.<sup>14</sup>

**The park provides important ecosystem services, valued at up to €25 million.** Pirin's forests play a valuable part in sequestering carbon dioxide from the

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*Brown bear is one of the iconic animals of Pirin National Park*

atmosphere. With approximately 25,000 hectares of forest, the park is estimated to store between 150,000 and 250,000 metric tonnes of carbon dioxide.<sup>15,16</sup> This equates to the annual emissions from 10,000 to 17,000 homes in Bulgaria,<sup>17,18</sup> and has an estimated annual value between €16 million and €25 million.<sup>19,20</sup> The forest cover also helps prevent floods and torrents, as well as soil erosion and landslides.

**Pirin is an important regional driver of socioeconomic development. The park generates an estimated €44 million in annual income from sustainable tourism and park-related activities,<sup>21</sup> and provides vital resources to 130,000 people.<sup>22</sup>** Pirin's landscapes and outdoor activities attract almost 80,000 tourists each summer.<sup>23</sup> Direct annual income from park tourism is estimated at €16 million, and sectors related to the park generate an estimated €28 million through more than 4,000 estimated full-time jobs.<sup>24</sup> Pirin's mountain pastures also play an important role for local dairy producers as their cattle graze on the fields in summer, and local vegetable producers rely on the water from the mountains for irrigation.<sup>25</sup> Further, there are more than 70 glacial lakes in the Pirin Mountains, and the national park's lakes and streams supply clean drinking water for many of the 130,000 people living in the seven municipalities around the park.<sup>26</sup>

**In total, through park revenues and ecosystem services, Pirin is valued at between €60 million and €69 million annually.<sup>27,28</sup>** As outlined above, Pirin generates €44 million through park revenues, non-skiing tourism and full-time jobs. Its ecosystem services, in the form of carbon sequestration, are valued between €16 million and €25 million. The total economic value of the park is equivalent to the annual income of between 8,500 and 9,800 Bulgarian households.<sup>29,30</sup>

**The park also has significant cultural and historical value.** Pirin includes archaeological sites with relics of several ancient populations that trace as far back as the Thracian population in the Iron Age (1000 BC). Pre-Roman fortress ruins are found inside the park within the Yulen Reserve, as are Byzantine and medieval churches.<sup>31</sup> Additionally, a historic wine road, known as the Wine Gate, runs through the park. It was used in the 18<sup>th</sup> and 19<sup>th</sup> centuries for transportation of fermented Melnik wines. The Pirin Mountains were also a strategic base in the fight for Bulgaria's independence from the Ottoman Empire. The area provided shelter to freedom fighters, helping Bulgaria to obtain independence in 1912.<sup>32</sup>

*Illegal hunting of chamois has been reported regularly in Pirin National Park*



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# THE THREATS:

## FURTHER SKI INFRASTRUCTURE DEVELOPMENT AND UNSUSTAINABLE MANAGEMENT THREATEN PIRIN'S ENVIRONMENTAL, ECONOMIC AND SOCIAL VALUES

**In 2000, the Bulgarian environment minister approved the construction of the Bansko ski resort within the Pirin World Heritage site.** The initial concession, awarded in 2001 to the private company Yulen AD,<sup>33</sup> permitted the construction of ski areas across almost 100 hectares in the World Heritage site adjacent to the Bansko municipality. However, Yulen AD expanded construction beyond the permitted areas.<sup>34</sup> In 2011, data from the Ministry of Environment and Water revealed that the ski zone utilizes 60 per cent more territory than originally contracted, and that about 40 per cent of the Bansko ski resort facilities were constructed without fulfilling necessary legal requirements.<sup>35,36</sup> Five constructed ski runs were not included in the concession contract and management plan of the park, and environmental permits were violated during the construction process.<sup>37</sup> Most ski runs exceed the permitted width by approximately 300 per cent.<sup>38</sup> The government authorized only manual work in the original contract, but Yulen AD used heavy bulldozers to build the ski runs, significantly changing the terrain. As a consequence, erosion and deforestation in areas surrounding the ski runs continued long after the construction was complete.<sup>39</sup>

**Ski zone construction caused irreversible damage, which triggered the specific areas to be removed from the World Heritage site.** In 2002, 2005 and 2007 the World Heritage Committee expressed concerns over the ski zone construction in Pirin.<sup>40</sup> Points of concern included the lack of adequate maps of the property, its buffer zone and proposed boundaries of construction zones, as well as the park management's low-quality responses to committee requests.<sup>41</sup> In 2010, the park's Bansko and Dobrinishte tourism zones were excluded from the World Heritage site and instead labelled as an unofficial 'buffer zone'.<sup>42</sup> However, the ski zones remained part of the national park. The boundary change was a direct result of the damage caused by ski infrastructure construction in the two areas (Figure 1).<sup>43</sup> Following this decision, the World Heritage Committee declared that it *"regrets that the Outstanding Universal Value of the property has been repeatedly and significantly impacted by the development of ski facilities and ski runs, to the extent that the property may be considered for inscription on the List of World Heritage in Danger, and that continued ski development is a critical threat to the Outstanding Universal Value of the property."*<sup>44</sup>

### ***Protected areas and ski resort facilities in Europe***

National parks in Bulgaria are considered IUCN category II areas,<sup>45</sup> and should be managed accordingly. The primary objective of IUCN category II parks is to protect natural biodiversity along with the underlying ecological structure and supporting environmental processes, and to promote education and recreation.<sup>46</sup> This objective aligns with the Bulgarian Protected Areas Act.<sup>47</sup>

Typically, European national parks have two main areas: a core area and a surrounding area, often called a buffer area.<sup>48</sup> The core area is protected as IUCN category II, and most construction is forbidden in this area. The surrounding area serves as an additional layer of protection to the core area, and falls under a less stringent IUCN category.<sup>49</sup> Bulgarian national parks have no buffer areas, so their whole territory is considered IUCN category II.<sup>50</sup>

Mercantour, France, and Hohe Tauren, Austria,<sup>51</sup> are examples of national parks with ski resorts that are close to, but not inside, the core area. In both cases, the core areas of the parks are considered IUCN category II and are strictly protected. Ski infrastructure is only allowed in the buffer areas and is forbidden from the core area.<sup>52-53</sup> In contrast, Pirin National Park has two “unofficial” buffer areas, which include the ski zones of Bansko and Dobrinishte. These buffer areas do not surround the national park, but penetrate it.

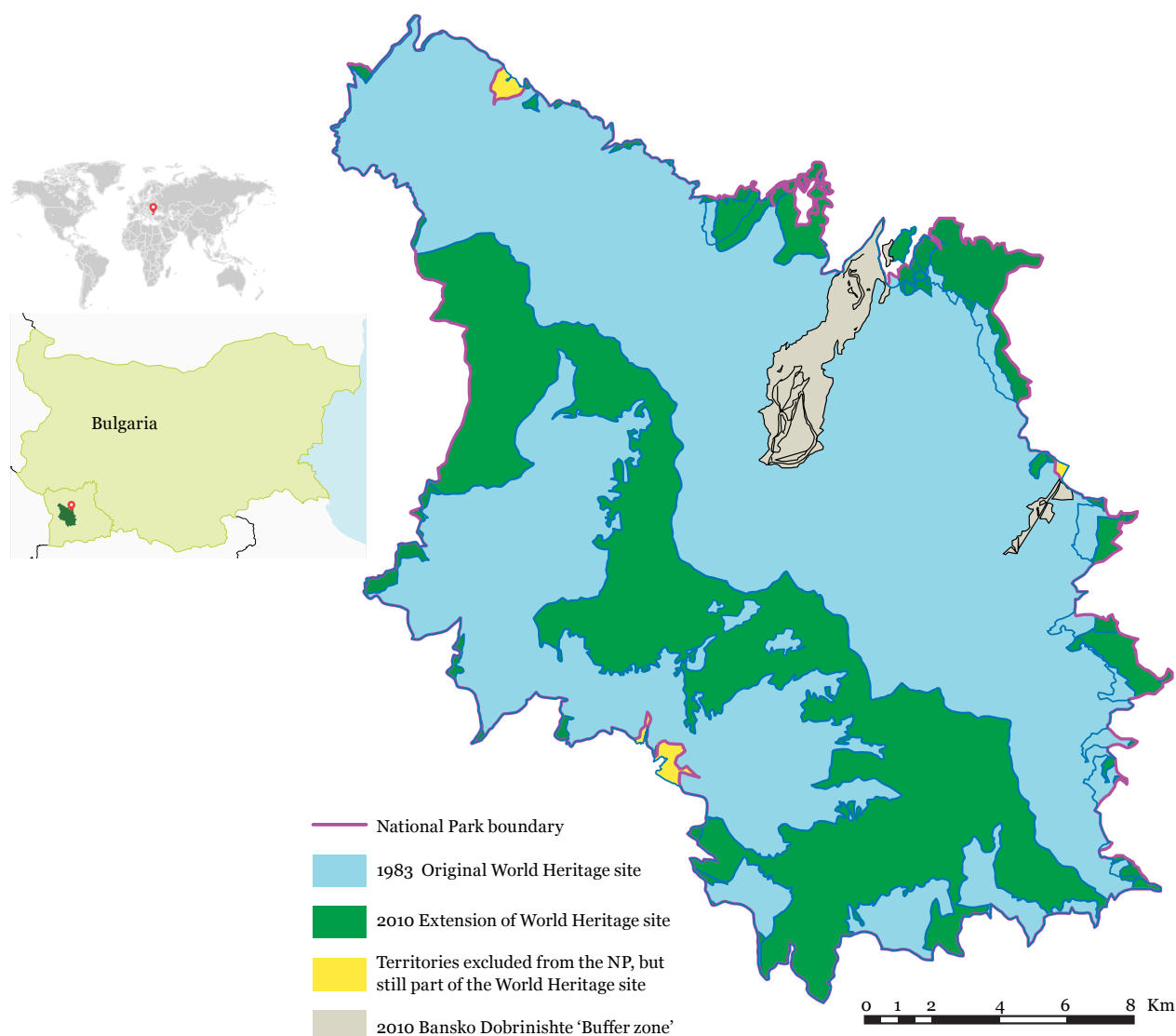
### ***Environmental impact of ski resorts***

There are a number of negative environmental impacts associated with the construction and operation of ski resorts.<sup>54</sup> Ski facilities have been found to decrease the abundance and diversity of flora and fauna, both by altering ecosystems and by disturbing wildlife.<sup>55</sup> For example, IUCN suggests that the decline in the alpine black grouse is linked to the spreading and intensification of winter sports.<sup>56</sup> Forest clearing for ski slopes increases the risk of surface runoff and erosion during heavy rains.<sup>57</sup> Ski resorts also increase pollution and contribute to climate change. Operating a single ski lift for one month requires approximately the same amount of energy as powering four households for a year, while trail groomers require approximately 19 litres of diesel per hour.<sup>58</sup> Ski resorts increasingly rely on water from local streams and lakes for snowmaking. Snow machines in Wachusett, USA, for instance, can draw up to 16,000 litres of water per minute, which is equivalent to using the water in an Olympic-sized swimming pool every 2.5 hours.<sup>59</sup>



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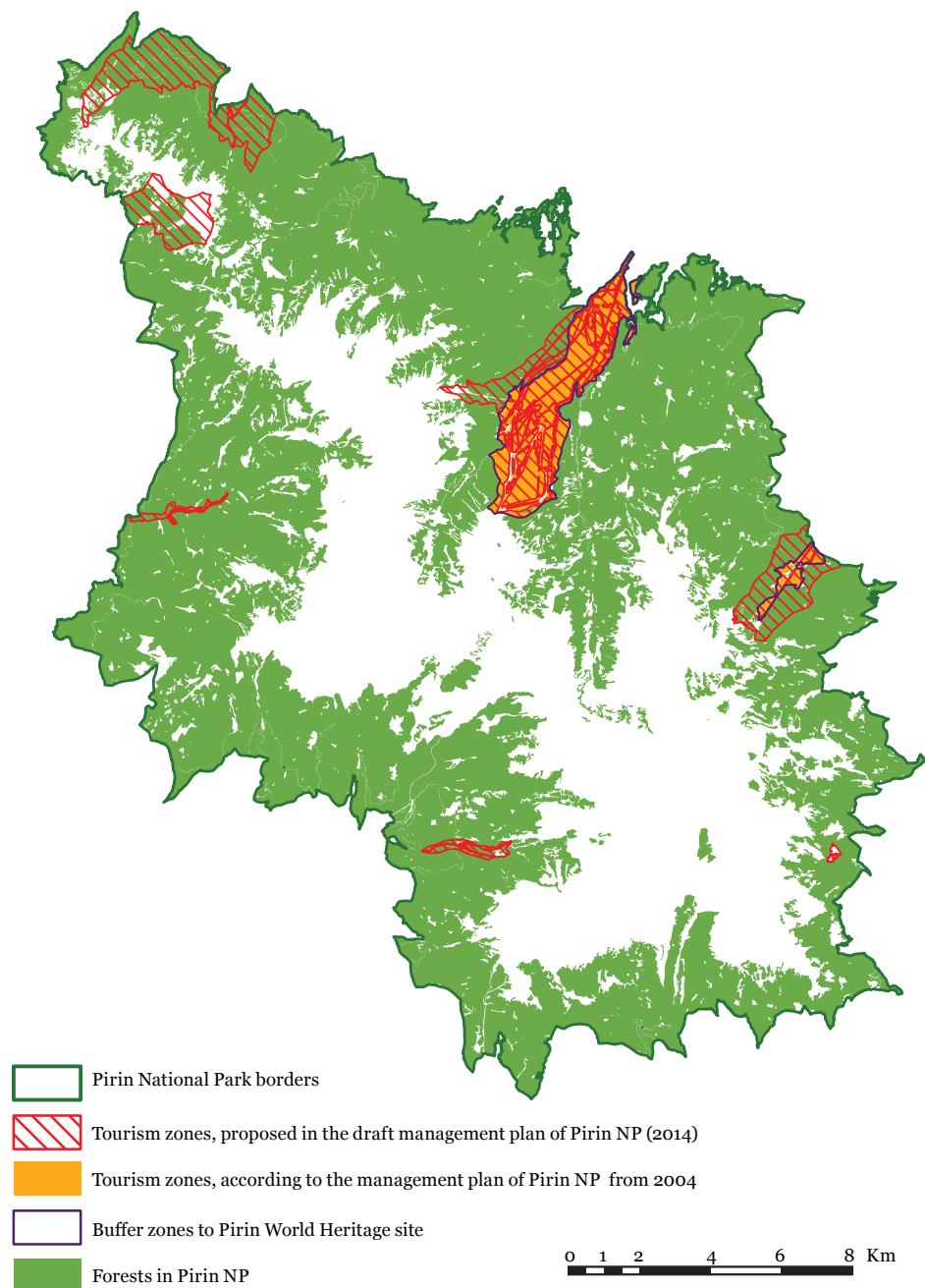
**Figure 1: Original World Heritage site and 2010 amendments**



**Despite World Heritage Committee concerns, Pirin’s new draft management plan increases the potential for further ski construction, and creates an uncertain future for the park.** The park’s existing management plan expired in 2014, but is still in use, as a new plan has not been approved yet. The new draft management plan, which will be valid until 2024, is currently being discussed and disputed. The plan reserves four major and three minor areas in the park as tourist zones.<sup>60,61</sup> While there is a ban on new construction in these areas, there is an exception for construction of “sport facilities”.<sup>62</sup> Experts fear that the language will be leveraged to circumvent environmental regulations in order to expand the current ski zones into the World Heritage site.<sup>63</sup> The draft plan is not accompanied by cost-benefit analyses or impact assessments. The draft also contradicts the vision outlined in both the park’s previous management plan (2005-2014) and the 2011 Strategy for Development of Sustainable Tourism.<sup>64</sup> Additionally, the draft plan is misaligned with the vision expressed by the local community. A survey of nearby residents found that 88 per cent of respondents agreed that “*economic growth and wealth are important for the society, but these should not be achieved by jeopardizing the nature.*”<sup>65</sup>

**The new draft management plan would permit construction on an area 12.5 times bigger than the current area, and could severely diminish Pirin’s economic, environmental and social values.** As drafted, the new management plan would allow construction of ski infrastructure inside 7.5 per cent of the park, compared to the original 0.6 per cent allowed (Figure 2).<sup>66</sup> This expansion would take place in some of the most pristine and valuable areas within the park, and would require cutting down old Macedonian and Bosnian pine trees. It is estimated that more than 3,000 hectares of forest would need to be felled to facilitate the planned expansion of ski areas.<sup>67</sup>

**Figure 2: Comparison of tourist zones between current and draft management plans**



### ***Viewpoints on sustainable skiing***

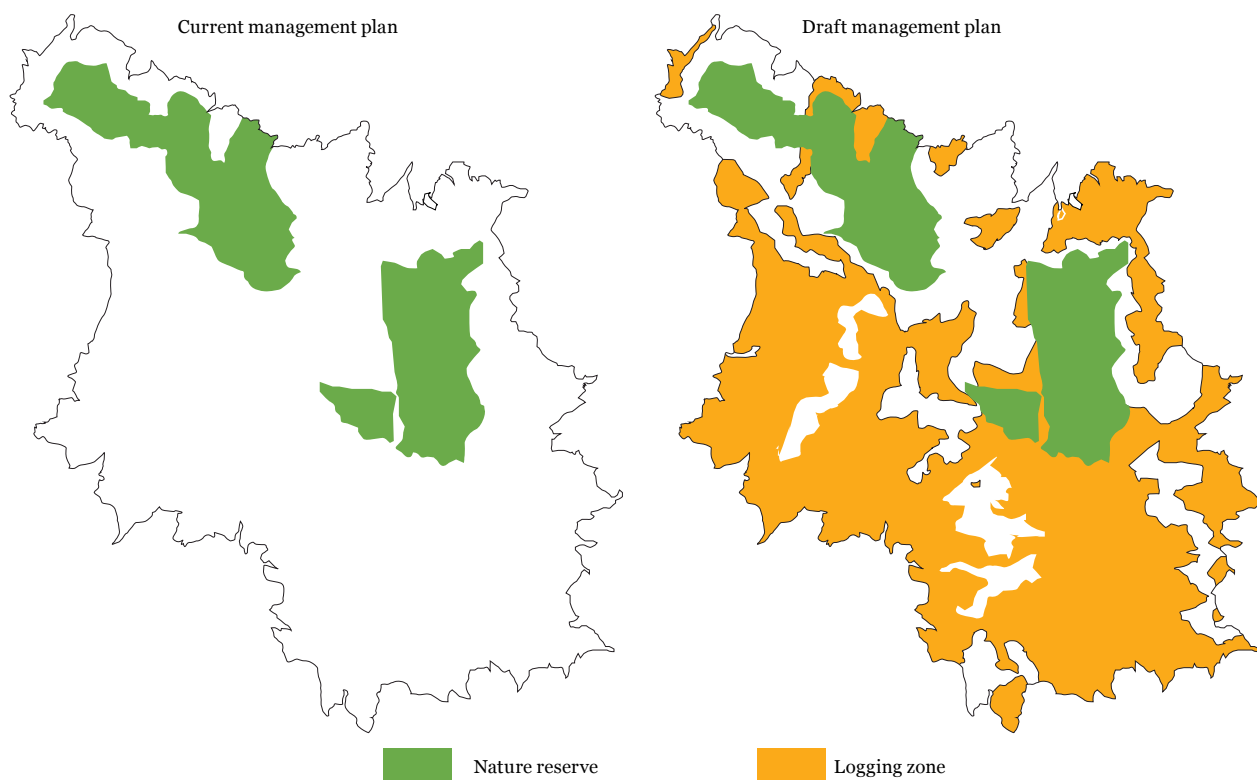
The **International Ski Federation (FIS)** acknowledges that skiing is dependent on the environment and has consistently worked to ensure sustainable ski development.<sup>68</sup> In 1994, the federation committed to the Mainau Manifesto and has since actively engaged in sustainability and environmental projects.<sup>69</sup> The Mainau Manifesto stresses that environmental protection is a leading principle for ski sports and that the events organized by FIS national member associations have to respect this principle.<sup>70</sup> Consequently, a key requirement for ski resorts to host FIS primary events, such as the World Championship, is to have an environmental policy that meets both local and international standards.<sup>71</sup>

**WWF supports sustainable skiing.** Skiing provides opportunities for sport and recreation and to be in close contact with nature. Skiing can also be an important stimulant to local economies. There are many areas where downhill ski development is appropriate. However, skiing can have a negative impact on ecosystems and their natural value when its development is not controlled and not regulated properly. Any investment must be prudent, with a longer-term perspective of the relative costs and benefits, and must be aligned with the principles of sustainable development of World Heritage sites (see the report's conclusion).<sup>72</sup>

**The new draft management plan would allow logging in 60 per cent of the national park.** The Bulgarian Protected Areas Act only allows logging for “maintenance and restoration activities” within national parks.<sup>73</sup> However, Pirin’s draft management plan permits the creation of “special management plans” for logging in 60 per cent of the national park. Experts warn that this provision would facilitate expanded logging activities, as sanitary logging does not need a special management plan because it is conducted on an ad hoc basis.<sup>74,75</sup> Additionally, the special management plans would allow logging to “secure the needs for firewood of the park, local communities, and local businesses.”<sup>76</sup> While sustainable sanitary logging should be encouraged and can benefit local communities, it is important that most of the forest’s dead wood remain on the forest bed as habitat for organisms. Deforestation has already caused soil erosion resulting in landslides, and in 2010 and 2016, floods caused severe damage to buildings, infrastructure and agricultural areas in Bansko.<sup>77</sup> Pirin’s *outstanding universal value* and the ecosystem services it provides would be severely threatened if logging is allowed within 60 per cent of the park (Figure 3).<sup>78</sup>



**Figure 3: Difference in logging zones between current and draft management plan**



**Provisions in the draft management plan pose a potential threat to Pirin’s wildlife, which is also at risk from poaching.** Ski infrastructure construction and widespread logging would seriously threaten the park’s wildlife by destroying, reducing and fragmenting Pirin’s natural habitats. Wildlife in the park is already threatened by poaching. According to IUCN, poaching is considered to be a high threat both inside and outside Pirin National Park. Illegal hunting of bears and chamois has been reported regularly.<sup>79</sup>

**The Bulgarian Ministry of Environment and Water has approved Pirin’s new draft management plan without subjecting it to a strategic environmental assessment.** According to UN guidance, strategic environmental assessments are tools for sustainable development, and they should be conducted much earlier in decision-making processes than project-based environmental impact assessments.<sup>80</sup> In March 2017, the Ministry of Environment and Water decided that Pirin’s draft management plan did not require a strategic environmental assessment despite the significant changes envisioned compared to the current plan.<sup>81</sup> The ministry also decided that it was not necessary to assess the potential impacts that the plan may have on the habitats and species in the park’s Natura 2000 sites. The move disregards the World Heritage Committee’s decision that requested a strategic environmental assessment and an assessment of compatibility with Natura 2000 objectives.<sup>82</sup> At the time of writing, the ministry’s decision is under dispute in court because it ignores the Bulgarian Environmental Protection Act and the Biodiversity Conservation Act.<sup>83</sup> An outcome is not expected to be reached until mid-2018. A strategic environmental

assessment must be conducted, and, as a result, the draft management plan should be updated to remove any allowances for construction and logging inside the national park and World Heritage site. If not, Pirin could be inscribed on the List of World Heritage in Danger as a consequence of the irreversible threat to its *outstanding universal value*.

**While awaiting the court decision, amendments to the current management plan were approved and could accelerate construction.** As of November 2017, the municipality of Bansko requested to finalize the implementation of amendments to the current management plan. The amendments would extend the ski construction area from the original 0.6 per cent to 2.8 per cent of the national park. The amendments also allow “building, repairment and reconstruction” activities on 45.2 per cent of the park’s surface, in areas dedicated to ecosystem conservation and recreation.<sup>84,85,86</sup> The government also started a procedure to amend Yulen AD’s concession contract in order to expand the allowed construction area from almost 100 hectares to 1,000 hectares.<sup>87</sup> The amendments to the current plan and concession contract would also retroactively legalize all past construction projects, and absolve Yulen AD from any prosecution for having breached the original contract. Contrary to the Environmental Protection Act, the Ministry of Environment and Water claims that changes to the current management plan and concession contract do not need a strategic environmental assessment, and could be approved by the Bulgarian government almost immediately. On December 12, Minister of Environment and Water Neno Dimov announced that the revision to the Bansko skiing concession contract had been withdrawn since new construction is not allowed without an updated management plan.<sup>88</sup> On December 28, the Bulgarian government approved the amendments to the current management plan, without providing any clarification on the public consultation outcomes that led to this decision.<sup>89</sup> The approval of the amendments generated sustained public protests across Bulgaria.<sup>90</sup>

**The amendments to the current plan took immediate effect, and will be valid until the new management plan is approved.**<sup>91</sup> The amendments to the current plan are effective from the day of approval.<sup>92</sup> Any new construction project that involves areas included in the amendments still needs to undergo government scrutiny to decide if a strategic environmental assessment and an appropriate assessment are required.<sup>93</sup> The adoption of a new management plan remains a legal necessity, and the new plan will replace the current plan and its amendments once introduced.<sup>94</sup>

***Viewpoint: The Bulgarian Ministry of Environment and Water (MOEW)***

The MOEW disagrees that the draft management plan will allow industrial logging in 60 per cent of the park’s territory and construction in a territory 12.5 times bigger than the present. The MOEW assures that the draft management plan does not allow commercial logging in Pirin and degradation of forest ecosystems. The MOEW also assures that the expansion of tourist zones does not allow for construction of further ski facilities – these are only allowed in the ‘buffer zone’. The MOEW stresses that the draft management plan adheres to 2012 Decision 36 COM 7B.18 of the World Heritage Committee, which prohibits any construction of ski facilities within the World Heritage site.

**Written comments from Miroslav Kalugerov, Director of Bulgaria’s nature protection service, Ministry of Environment and Water, December 2017<sup>95</sup>**



© Emil Bachvarov/WWF

*Pirin's forest includes Bulgaria's oldest pine tree, the 1,300 year old Baikushev's Pine*



# ON THE EDGE

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A hiker walking over the famous Koncheto (Small Horse) ridge in Pirin National Park. Expanding the ski infrastructure in Pirin is not necessary, and sensitive use of existing facilities combined with sustainable economic development can better capture the long-term potential of the park. Investors can focus on extending the tourism offering beyond skiing by developing year-round activities to attract more visitors in spring, summer and autumn months. Potential opportunities include wildlife tours and guided hiking tours.



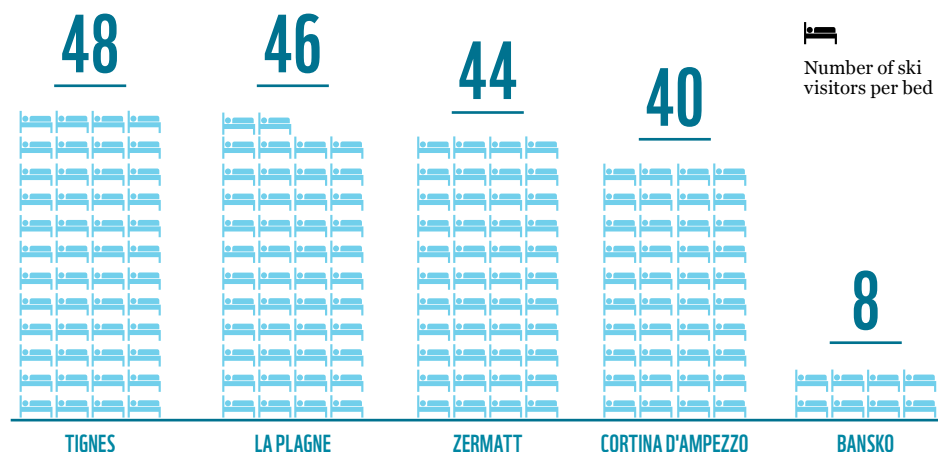
# IN FOCUS:

ASSUMPTIONS UNDERLYING THE BUSINESS CASE FOR SKI EXPANSION ARE WEAK. A GAMBLE WITH POOR ODDS.

**The planned ski expansions in Bansko and Dobrinishte aim to increase income, yet the ski zones have had mixed economic impact on the local economy to date.** Ski expansion investments aim to further attract visitors to the area, which would purportedly increase income and profitability of the ski zones. However, in 2013, Bansko's local tourism operators ran at loss of €2.85 million,<sup>96</sup> and the unemployment rate in the municipality grew from 4 per cent in 2007 to 8 per cent in May 2017.<sup>97</sup> Winter ski tourism creates seasonal jobs that do not provide income to people or revenue for businesses during summer months. Many hotels are closed throughout the summer while a seasonal winter working force is brought in, thereby driving local unemployment.<sup>98</sup> Furthermore, living conditions in Bansko have not improved with the construction of the ski resort. Since the early 2000s, population numbers have been declining, and property values have decreased by 70 per cent over the last decade – especially for the old buildings that are mostly owned by local residents.<sup>99</sup> Gains have mainly benefited a small group of investors and financiers rather than the local population at large, and the lack of diversification of the local economy could further intensify this trend.<sup>100</sup>

**Bansko does not maximize its accommodation and ski lift capacity, which suggests the need for consolidation rather than expansion.** There are approximately 140,000 ski tourist visits in Bansko annually.<sup>101</sup> The resort counts around 18,000 available tourist beds and the capacity of its ski lifts is about 21,000 people per hour. Established European resorts have more than five times the number of visitors to beds compared to Bansko (see Figure 4). To achieve a similar ratio to other resorts, Bansko would have to attract 670,000 annual ski visitors. Other European ski resorts with comparable lift capacity also attract between two and three times more ski visitors.<sup>102,103</sup> This suggests that the attractiveness of a ski resort depends more on the quality of its facilities, rather than the quantity of ski lifts. More ski infrastructure can increase these inefficiencies, and investments should focus on extracting more value from the existing facilities rather than building new ones.

**Figure 4: Tourist bed capacity compared to total ski visitors across European ski resorts<sup>104</sup>**



**Climate change effects further decrease the probability of running a profitable ski resort in Pirin.** The rise of global temperatures will continue to affect winter tourism. Since 1970, Bulgaria has had a clear trend of rising temperatures, which is likely to continue.<sup>105</sup> The Institute for Snow and Avalanche Research warns that even if global warming is limited to two degrees Celsius, the snow layer in the Alps is expected to decrease by 30 per cent by the end of the century.<sup>106</sup> As many as two-thirds of Alpine ski areas could go out of business if current climate change trends continue, and low-lying ski resorts will be hardest hit by these impacts.<sup>107</sup> In Bulgaria, winter months are getting shorter, and snow cover is getting thinner.<sup>108,109</sup> Further, multiple periods of two to six consecutive years of poor snow conditions are expected between 2020 and 2050.<sup>110</sup> Given its more southern latitude, Bansko's average temperatures are already three degrees higher than resorts in the western Alps that are at similar elevations.<sup>111,112</sup> It is also not feasible to extend the ski resorts higher up the Pirin Mountains as these areas are all within the national park and have extremely steep slopes. It would be difficult and expensive to construct lift systems to access these higher elevations.<sup>113</sup>

**Snowmaking is a common mitigation strategy for low snowfall, but snow production is expensive and can pressure the local water supply.** The Association of Austrian Cableways has estimated that producing one cubic metre of snow costs €3-5,<sup>114</sup> and that 30cm of snow cover requires 1,000-1,200 cubic metres of water per hectare.<sup>115</sup> All of Bansko's ski runs already depend on artificial snow,<sup>116</sup> and covering the current area (122 hectares of ski runs) is estimated to require almost 150 million litres of water at a cost of €440,000. The total seasonal cost could amount to more than €3 million.<sup>117</sup> Experts also question the feasibility of producing snow in the high temperatures that are likely to occur in the lower parts of the ski zone.<sup>118</sup> Artificial snow contains up to five times more water than natural snow, and its extensive use pollutes local water sources and causes alterations to the vegetation cover.<sup>119</sup> Additionally, the water used for artificial snowmaking comes from the same sources as the drinking water for local communities.<sup>120</sup> IUCN notes that "*concerns are high with regards to potentially increasing pressures on resources required to maintain skiing tourism under the changing climate.*"<sup>121</sup> Approximately 30 per cent of the water transformed into artificial snow is permanently lost, which could put the local water supply at risk.<sup>122</sup>

**Investing only in ski infrastructure expansion would expose investors to high risks, which could be mitigated by investing in a broader value proposition for the area.** Most European ski resorts mainly rely on domestic skiers to operate profitably, and the global share of international skiers is only 12 per cent.<sup>123</sup> With approximately 350,000 domestic Bulgarian skiers and a low national participation rate,<sup>124</sup> there is limited scope for expansion via domestic skiers. Investing in ski infrastructure expansion also entails risks related to negative environmental impacts and climate change, as outlined above. To hedge these risks, ski infrastructure development could be limited to increasing the quality and safety of existing facilities to secure visitor retention. Investors could then focus on extending the tourism offering beyond skiing by developing year-round activities to attract more visitors in spring, summer and autumn months.

# THE SOLUTION:

## FOUR CONCRETE STEPS TO CREATE A SUSTAINABLE FUTURE FOR PIRIN

**Immediate action is required to safeguard Pirin and prevent it from being inscribed on UNESCO's List of World Heritage in Danger.** This report recommends four concrete steps to help overcome the current threats, and to build a sustainable future for Pirin. In summary, the Bulgarian government, with support from the international community, private sector entities, scientific institutions and civil society groups, should:

1. Reject the draft management plan and abolish the amendments to the current plan;
2. Conduct strategic assessments and feasibility studies;
3. Identify alternative solutions to ski tourism and develop a year-round sustainable tourism and income diversification strategy; and
4. Develop a new management plan and conduct necessary impact assessments.

**1. The draft management plan must be rejected and the latest amendments abolished due to their threats to Pirin National Park.** In its current form, the draft management plan would allow for significant expansion of sport facilities in the tourist zones, as well as widespread logging operations inside the park. As a result, the draft management plan must be rejected to allow for a more sustainable version that considers the intrinsic values of Pirin and supports sustainable development in the area. The recent amendments accepted to the current plan should be abolished on similar grounds.

**2. Strategic assessments and feasibility studies should be conducted to understand opportunities and risks of any development in the area.** The proposed activities in and around Pirin do not rest on clear strategic assessments for further expansion of the ski resort or other tourist activities. The business case for further ski expansion in Bansko is currently weak. Any plans for expanded tourism activities should draw upon a thorough socio-economic needs assessment and a cost-benefit analysis. Feasibility studies must also be conducted to understand any risks related to construction, and the local community should be involved in the decision-making process.

**3. Alternative income opportunities should be identified and incorporated in a year-round sustainable tourism and income diversification strategy for the area.** In the short term, some of the facilities in the current ski zones will need upgrading to function safely. Any associated construction work should minimize the impact on the environment.<sup>125</sup> In the longer term, Bansko should develop a strategy for year-round tourism and income diversification that focuses on making the area less dependent on ski income. There is a need to analyse alternative income streams for the region. Potential opportunities include developing summer activities related to the park, such as wildlife tours and guided hiking tours; increasing hotel utilization through business conferences and spa and wellness tourism; and utilizing the current ski facilities and forest roads in the summer through mountain biking opportunities. Sustainable nature-based livelihoods such as low-impact agriculture around the park boundaries and sustainable collection of non-timber forest products should also be explored.



### **Alternatives for Pirin: Business opportunities outside the ski season**

There are three types of tourism-related activities that could generate income to local communities and investors.

#### **i. Further develop spring, summer and autumn activities related to the park**

**Wildlife tours:** Pirin's mammals and birds create attractive eco-tourism opportunities. Local tourist operators, together with the national park, could focus on developing opportunities for groups and individuals to take part in conservation activities and wildlife viewing.<sup>126</sup> In 2016, USAID funded the Regional Economic Growth project in the Western Balkans, a programme that supports the development of bear watching and conservation volunteer experiences.<sup>127</sup> The brown bear, grey wolf and chamois attract a considerable number of high-paying tourists in Eastern Europe. Prices for wildlife-watching tours range from €130 per day in Romania<sup>128</sup> to €185 per day in Moldova<sup>129</sup> and Serbia.<sup>130</sup> There could be significant additional income from attracting naturalists and walkers to Pirin. The park has more than 150 bird species, including eagles, hawks, owls, grouse and woodpeckers,<sup>131</sup> which offer bird-watching opportunities that can attract high-paying visitors. A study suggests that the number of European birdwatchers willing to travel to long-haul destinations to see new species is growing, and that birdwatchers spend more money than general tourists (see Figure 5 for a Bulgarian estimate).<sup>132</sup>

**Historical and guided hiking routes:** Hiking tours can be an important source of income for mountain resorts, and Pirin's peaks, glacial lakes and historical sites offer opportunities for attractive excursions. In 2014, Bosnia and Herzegovina received funding from USAID to develop its part of the Via Dinarica, a 2,000 kilometre hiking trail that connects seven Balkan countries. USAID defined this trail as a platform for sustainable tourism development and local economic growth.<sup>133</sup> In 2017, Via Dinarica was one of *National Geographic Traveller's* Best Trips,<sup>134</sup> and a week-long tour along Via Dinarica in the Balkans costs on average €100 per day.<sup>135</sup> Pirin could become a similarly priced destination for hikers if branded correctly, for example by leveraging the UNESCO status of the park.

**Sporting events and adventure activities:** Demand for extreme sport challenges such as marathons and triathlons is increasing. According to the German Ultramarathon Foundation, the number of participants in ultramarathons (races longer than 42 kilometres) grew from 40,000 in 2000, to 413,000 in 2015.<sup>136</sup> The 2017 Ironman in Chattanooga, USA attracted 4,500 athletes, 16,000 tourists and 20,000 spectators. It generated 15,700 hotel bookings and €19 million in revenue for the city.<sup>137</sup> These events also showcase the cultural and natural heritage of host areas.<sup>138</sup> Bansko already organized the Pirin Ultra run in 2015 and 2016, and there is a significant opportunity to increase the number of participants for future events.

#### **ii. Increase hotel visits – for tourists and other travellers**

**Spa and wellness:** Pirin is well positioned to capitalize on the global spa and wellness market, which is expected to grow by 5-6 per cent annually through 2020.<sup>139</sup> A spa and wellness tourist spends more than double the average tourist.<sup>140</sup> Bulgaria ranks first in Europe for availability and diversity of mineral water and spa resorts,<sup>141</sup> and Pirin has several ideal locations that could be developed for spa and wellness tourism. Sandanski, a town located

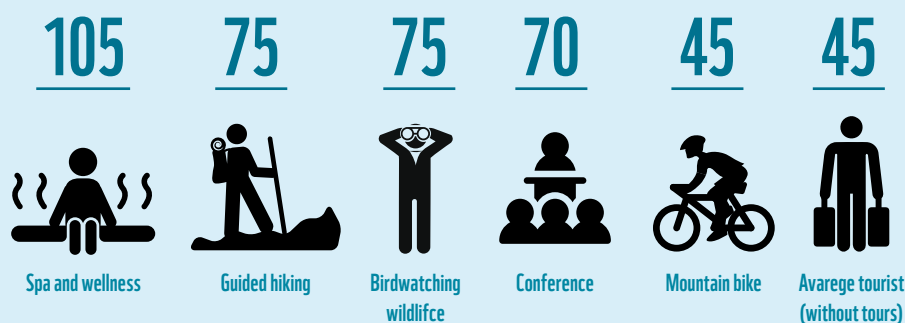
in the southern part of Pirin, counts more than 20 hot springs, and its waters attract tourists for their therapeutic benefits.<sup>142</sup> Velingrad, a town close to Pirin, was nominated Spa Capital of the Balkans by the International Hotel and Restaurants Association. Velingrad's hospitality sector has no ski infrastructure and relies only on its wellness industry. In 2013, the hospitality sector in Velingrad was profitable, indicating the potential to run viable businesses in this sub-sector.<sup>143</sup> Dobrinishte, Banya, Ognyanovo, Musomishta, Simitli, Oshtava, Gorna Breznitsa and Gorna Gradeshnitsa, all in the Pirin outskirts, are other places with hot mineral springs that could be developed for spa and wellness tourism investments.

**Conferences and festivals:** Bansko already has a number of festivals and events, and could further focus on branding itself as a conference and festival town to increase utilization of existing hotel facilities year-round. It is estimated that conferences can increase hotel revenues by 15 to 50 per cent, and business conference travellers are a high-yielding tourist segment (Figure 5).<sup>144</sup> Davos in Switzerland is an example of a mountain resort hosting important events. The annual World Economic Forum conference generated 117,000 hotel bookings over four days in 2017.<sup>145</sup> Local folklore festivals and international events, such as the Bansko International Jazz Festival, can also increase tourist numbers when skiing is not possible, but there might be a need to expand festival facilities in the towns surrounding Pirin.

### iii. Optimize utilization of existing ski infrastructure year-round, in a sensitive manner

**Mountain and cross-country biking:** Ski resorts worldwide increasingly recognize the potential of mountain biking to extend their tourist season.<sup>146</sup> More than 30 ski resorts in North America now offer lift-based mountain biking during the summer months.<sup>147</sup> The alpine Swiss canton of Graubünden estimated the typical mountain bike tourist stays 2.7 days and spends €160 per day, which is equivalent to €45 per day in Bulgaria (Figure 5).<sup>148</sup> Mountain bike facilities in Bansko could utilize the current forest roads and lifts for downhill trails, and thereby have minimal additional impact on the environment. Visitors could also be attracted by more scenic routes and multi-day trips, such as the route from Bansko to the Rila Monastery.<sup>149</sup>

**Figure 5: Estimated daily expenditure by tourist type in Bulgaria (€, 2017)<sup>150</sup>**



**4. Following the previous steps, a new management plan must be developed to reflect the joint commitment of all stakeholders to a sustainable Pirin.** Any new management plan must respect Pirin’s status as a protected area, while reflecting the viewpoints of local communities, Pirin National Park’s management, non-governmental organizations, scientific institutions, the Bulgarian government and the international community, including IUCN. A new management plan for Pirin must also be accompanied by an independent strategic environmental assessment and an assessment of compatibility with Natura 2000 objectives, as requested by the World Heritage Committee.<sup>151</sup> Legal experts must review the plan and the Territorial Spatial Development Plan for the area to ensure that the documents are consistent and accurate.<sup>152</sup> If needed, an independent mediator could lead the negotiations to overcome the conflicting relationships between the different stakeholder groups. IUCN has previously played a mediating role in similar situations and could, as an international organization, function as an effective and impartial mediator if funding is provided for the work.<sup>153</sup>

*“In the future and in the new management plan, a greater focus should be on promoting a sustainable and more balanced development of livelihoods. Emphasis should be on a diversification of tourism both in terms of products, services and season, in line with the new strategy for sustainable nature tourism, developed by the Pirin National Park Directorate as a viable alternative to ski-based tourism development.”*

**IUCN World Heritage Outlook<sup>154</sup>**





# LOOKING TO THE FUTURE

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The world is looking to Bulgaria to save Pirin. The Bulgarian government should work with regional authorities, private sector entities, scientific institutions and civil society groups to develop a new management plan to ensure that it respects Pirin's social, environmental and economic values and focuses on long-term sustainable tourism.



# CONCLUSION:

## PIRIN AND THE PRINCIPLES FOR SUSTAINABLE DEVELOPMENT OF WORLD HERITAGE SITES

### **The future of Pirin must build on the principles of sustainable development of World Heritage sites.**

The five principles of sustainable development prevent over-extraction and exploitation of resources in and around World Heritage sites to protect and conserve their *outstanding universal value*. The application of these principles can help decision-makers achieve an appropriate and equitable balance between conservation, sustainability and development.<sup>155</sup>



*1. Valuation that is socially conscious.* All development plans in Pirin must be subject to independent strategic environmental assessments and assessments of compatibility with Natura 2000 objectives, as requested by the World Heritage Committee.<sup>156</sup> Any valuations that identify irreversible damage to the park should result in the proposed plan being rejected, and further activities banned. Specifically, rigorous assessments must examine the impacts of any proposed renewal of existing ski areas, as well as expanded logging rights, in the park itself or other surrounding areas. Construction plans for new ski areas inside the national park must be banned.



*2. Investment decisions that focus on long-term value.* Future investments in the park and its surrounding areas should favour activities that contribute to the conservation of the park, rather than those that exploit short-term opportunities. Investments in the Pirin area must also focus on year-round tourism activities and opportunities that provide alternative sources of income, to reduce the dependency of the local economy on winter tourism.



*3. Governance that is representative of all beneficiaries.* The Bulgarian government should reaffirm its support to the 2013 Charter for Development of Sustainable Tourism in Bulgaria. The charter outlines a set of sustainable principles based on collective input from state institutions, local authorities, businesses and non-governmental organizations engaged in tourism development. Local residents must be involved in planning and decision-making processes to ensure that their interests are respected. To ensure equitable outcomes, benefit-sharing mechanisms could also be developed to distribute a proportion of park-generated income to local communities around Pirin.



*4. Policymaking that is evidence-based and transparent.* Several of the problems currently surrounding Pirin stem from a lack of transparency, and from poor implementation of the concession contract and the new draft management plan. For example, the precise size of the concession area is disputed by the concessioner, which claims that it is unclear how the area should be measured.<sup>157</sup> Any future developments in the park must be supported by clear, undisputed regulations and analyses, leaving no room for diverging interpretations. There is a need to be proactive and include these analyses upfront in the decision-making processes to create a common platform for further discussion.



*5. Regulations that are enforced and followed.* The Bulgarian government must ensure that the local, national and international regulations that protect Pirin are respected and enforced. The UNESCO World Heritage Committee should strengthen compliance with the World Heritage Convention and, if needed, add Pirin to the List of World Heritage in Danger. Concessionaries and infrastructure developers should be precautionary and refrain from making investments where the potential impact of new

activities is not fully analysed and understood. When legal ramifications are unclear, consultations should clarify the situation before investments commence.

**Looking ahead, developments in the park’s municipalities should be guided by a national strategy for sustainable winter and summer tourism.** There is a need to guide Pirin’s tourism developments in a national strategy that focuses on long-term sustainable development and non-intrusive, year-round activities. Such a strategy must present the principles for any ski infrastructure construction and identify areas where winter tourism can be developed without damaging any of Bulgaria’s pristine ecosystems, including Pirin. This must also be designed and implemented in cohort with all stakeholders to minimize conflicts of interest and to promote shared responsibility for Bulgaria’s natural heritage.

**If successful, Pirin could serve as a blueprint for sustainable management of mountain ecosystems in Bulgaria and beyond.** Mountain ecosystems are under pressure around the world – both from climate change and from increasing human activities. Other Bulgarian parks such as Rila National Park and Vitosha Nature Park face similar threats to Pirin, and if approved, their draft management plans would permit harmful construction inside both parks.<sup>158</sup> Protecting Pirin while improving economic opportunities in the region would show that sustainable development is possible, and it would provide valuable lessons learned for stakeholders in Rila, Vitosha, Western Caucasus, and other protected mountain areas. It would also reaffirm Bulgaria’s commitment to the UN Sustainable Development Goals, while protecting our shared heritage for current and future generations.

#### ***A cautionary tale: Western Caucasus and the impact of the Sochi Winter Olympics***

In 2014, Russia hosted the Winter Olympics in Sochi. The majority of the facilities and asphalt roads for the event were built inside the Sochi National Park and Western Caucasus World Heritage Site, causing irreversible damage to the ecosystem.<sup>159</sup> More than 3,000 hectares of rare forests were cleared and several bird species, bears and reptiles have disappeared from the area.<sup>160</sup> The River Mzymta used to be a spawning area for approximately 20 per cent of the endangered Black Sea population of Atlantic salmon, but the salmon have now disappeared following river pollution and destruction of the river bed. Sites where red deer and wild boar overwintered were uprooted, and migration routes used by bear and ibex on the Aibga mountain range were destroyed.<sup>161</sup> Recent plans to further expand Sochi ski resorts risk removing vital corridors used by free-roaming animals.<sup>162</sup> These expansion plans would also compromise the reintroduction programme of the endangered Persian leopard.<sup>163</sup>

# ANNEX

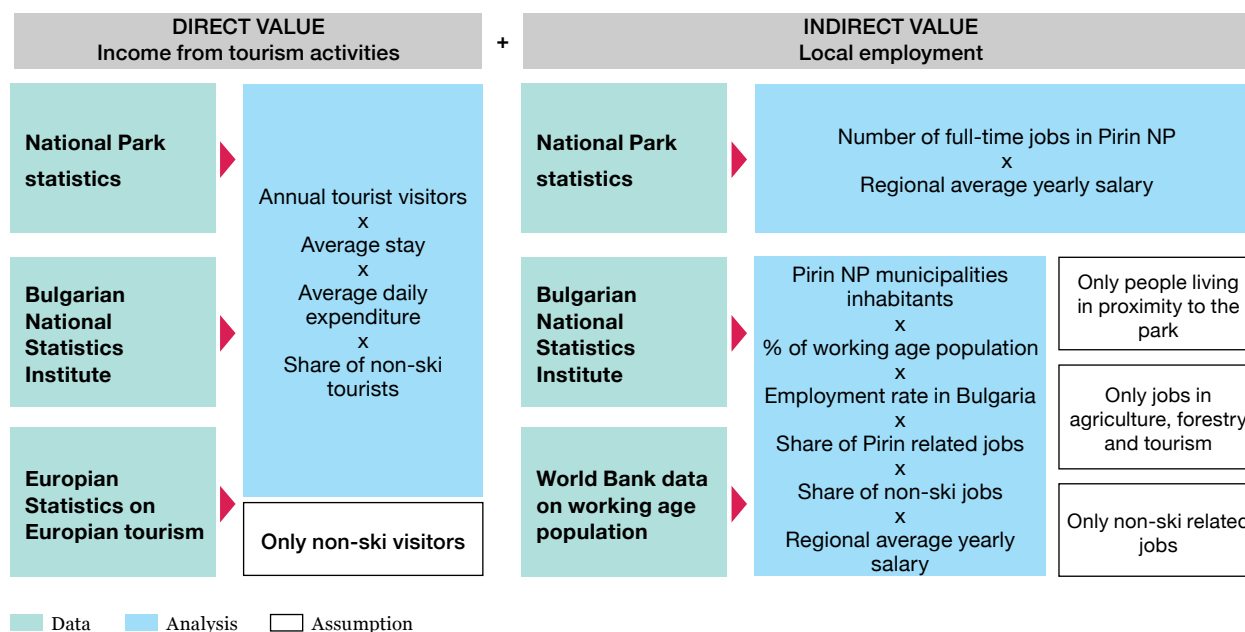
## METHODOLOGY FOR ESTIMATING THE YEARLY ECONOMIC VALUE OF PIRIN NATIONAL PARK

Dalberg used a mixed methodology based on statistical data and assumptions to estimate the annual economic value of activities and services generated by Pirin National Park. The methodology deliberately excluded any income generated by ski tourism as this is not currently sustainable. Summer and winter activities were considered separately, and Dalberg only considered jobs in agriculture, forestry and tourism.

Dalberg defined the economic value of Pirin National Park as the sum of direct and indirect value generated by the park:

- **Direct economic value** includes income generated by activities and services directly related to the national park, and specifically tourist expenditure. Dalberg included 100 per cent of the summer visitors, assuming all of these are part of sustainable tourism activities. Dalberg included 10 per cent of the winter visitors to account for the small portion of winter visitors that do not come to Pirin for skiing.
- **Indirect economic value** includes economic benefits for local communities in the form of income generated by jobs related to park activities and services. The methodology estimates both the incomes generated by full-time jobs in the park management, and jobs in related sectors and businesses.

The total annual economic value generated by Pirin National Park is estimated at €44 million, and the national park is estimated to generate and support 4,200 full time jobs.





## METHODOLOGY FOR TEMPERATURE COMPARISON ANALYSIS

Dalberg selected seven ski resorts across Austria, France, Italy and Switzerland to compare the average temperatures of Bansko to the Alps. Only ski resorts with an elevation similar to Bansko were considered.

Dalberg used data from the Weatherbase, which shows the average monthly temperatures over the last 30 years for every location.<sup>164</sup> Only winter months and average temperatures<sup>165</sup> were considered.

The analysis shows the average temperature over the five winter months for every location; the difference between the average temperature in Bansko and the individual resorts; and the average temperature difference between Bansko and all the resorts in the Alps combined.

AVERAGE TEMPERATURES (DEGREES CELSIUS)										
LOCATION	COUNTRY	ELEVATION (M)	NOV	DEC	JAN	FEB	MARCH	AVERAGE WINTER MONTHS	DIFFERENCE RESORT - BANSKO	AVERAGE DIFFERENCE ALPS - BANSKO
FAI DELLA PAGANELLA	ITALY	950	-1.2	-3.8	-4.8	-4.9	-3.5	-3.64	-6.08	
GSTAAD	SWITZERLAND	1100	0.8	-3.3	-4	-2.3	0.7	-1.62	-4.06	
LIENZ	AUSTRIA	680	0.6	-4.2	-5.2	-1.9	3.1	-1.52	-3.96	
DOLLACH	AUSTRIA	980	1.2	-1.8	-2.8	-1.6	1.8	-0.64	-3.08	-3.08
KOMAT	AUSTRIA	900	1.7	-1.2	-2.1	-1.2	2.1	-0.14	-2.58	
CHATEAU-D'OEX	SWITZERLAND	980	2.1	-1.1	-2	-1.1	2.6	0.1	-2.34	
<b>BANSKO</b>	<b>BULGARIA</b>	<b>900</b>	<b>6.1</b>	<b>1.1</b>	<b>-1.1</b>	<b>1.1</b>	<b>5</b>	<b>2.44</b>	<b>0</b>	
BOURG ST-MAURICE	FRANCE	850	5	1.4	0.7	2	5.9	3	0.56	

## ENDNOTES

- 1 World Heritage Convention. 2017. *Pirin National Park*. whc.unesco.org/en/list/225
- 2 Ibid.
- 3 World Bank. 2017. *Land Area (sq. km)*. data. worldbank.org/indicator/AG.LND.TOTL.K2
- 4 World Heritage Convention. 2017. *Pirin National Park*. whc.unesco.org/en/list/225
- 5 European Commission. 2017. *Natura 2000*. ec.europa.eu/environment/nature/natura2000/index\_en.htm
- 6 IUCN. *Pirin National Park*, Bulgaria. www.iucn.org/sites/dev/files/import/downloads/pirin\_fact\_sheet\_final.pdf
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- 15 Carbon Neutral. 2017. *FAQs*. carbonneutral.com.au/faqs/#\_Toc411009573
- 16 Food and Agriculture Organization. 2003. *Forest and climate change*. www.fao.org/tempref/docrep/fao/011/ac836e/ac836e00.pdf; the calculation assumes that each hectare of forest captures between 6 and 10 metric tonnes of CO<sub>2</sub>.
- 17 World Energy Council. 2014. *Energy efficiency indicators*. wec-indicators.enerdata.net/secteur.php#/co2-emissions-per-household.html
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- 19 Ding et al. 2011. *Carbon Sequestration Services: An Economic Assessment of Climate Change Impacts*. www.bioecon-network.org/pages/UNEP\_publications/09%20European%20Forests.pdf; the calculation assumes that each hectare of forest captures CO<sub>2</sub> at an annual value of €1,000.
- 20 United States Environmental Protection Agency. 2017. *The Social Cost of Carbon – Estimating the Benefits of Reducing Greenhouse Gas Emissions*. 19january2017snapshot.epa.gov/climatechange/social-cost-carbon\_.html; the calculation assumes that each hectare of forest captures between 6 and 10 metric tonnes of CO<sub>2</sub> at an annual value of €105 per hectare.
- 21 The annex includes a methodology for this estimate. Note that this estimate does not include income from ski tourism, and ski-related tourism activities.
- 22 Bulgarian National Statistical Institute. 2015. *Socio-economic Data and Analysis Collection*. Data available through WWF-Bulgaria. We include population numbers from Bansko, Gotze Delchev, Sandanski, Strumyani, Kresna, Simitli, Razlog.
- 23 Pirin National Park. 2016. *Draft management plan 2014-2023*. pu-pirin.com/images/dokumenti\_do\_DNP-Pirin/PUNPP\_16.05.2016/00-PUNPP\_16.05.2016-dnpp.pdf
- 24 The annex includes a methodology for this estimate. Note that this estimate does not include income from ski tourism, and ski-related tourism activities.
- 25 Dalberg correspondence with WWF, November 2017.
- 26 Bulgarian National Statistical Institute. 2015. *Socio-economic Data and Analysis Collection*. Data available through WWF-Bulgaria. We include population numbers from Bansko, Gotze Delchev, Sandanski, Strumyani, Kresna, Simitli, Razlog.
- 27 Ding et al. 2011. *Carbon Sequestration Services: An Economic Assessment of Climate Change Impacts*. www.bioecon-network.org/pages/UNEP\_publications/09%20European%20Forests.pdf; the calculation assumes that each hectare of forest captures CO<sub>2</sub> at an annual value of €1,000.
- 28 United States Environmental Protection Agency. 2017. *The Social Cost of Carbon – Estimating the Benefits of Reducing Greenhouse Gas Emissions*. 19january2017snapshot.epa.gov/climatechange/social-cost-carbon\_.html; the calculation assumes that each hectare of forest captures between 6 and 10 metric tonnes of CO<sub>2</sub> at an annual value of €105 per hectare.
- 29 Eurostat. 2017. *Average household size 2006-2016, 2017*. ec.europa.eu/eurostat/statistics-explained/index.php/File:Average\_household\_size,\_2006\_and\_2016\_(average\_number\_of\_persons\_in\_private\_households)\_new.png
- 30 CEIC. 2016. *Bulgaria Household Income per Capita*. www.ceicdata.com/en/indicator/bulgaria/annual-household-income-per-capita
- 31 World Heritage Datasheet. 2017. *Pirin National Park*. yichuans.github.io/datasheet/output/site/pirin-national-park

- 32 Ibid.
- 33 The municipality of Bansko is a shareholder in this company.
- 34 Novinite Sofia News Agency. 2012. *UNESCO: Building New Ski Facilities in Bulgaria's Pirin Is Inadmissible*. [www.novinite.com/articles/140593/UNESCO%3A+Building+New+Ski+Facilities+in+Bulgaria%27s+Pirin+Is+Inadmissible](http://www.novinite.com/articles/140593/UNESCO%3A+Building+New+Ski+Facilities+in+Bulgaria%27s+Pirin+Is+Inadmissible)
- 35 Environmental Justice Atlas. 2014. *Pirin National Park illegal ski resort, Bulgaria*.
- 36 Ibid.
- 37 Save Pirin Coalition of NGOs. 2006. *Save Pirin*.
- 38 Ibid.
- 39 Dalberg expert interview, November 2017.
- 40 World Heritage Convention. 2017. *Pirin National Park*. [whc.unesco.org/en/soc/2584](http://whc.unesco.org/en/soc/2584) (see decisions under 2002, 2005, 2007).
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# Pirin in numbers

100%  
RECYCLED



60%

Of Pirin National Park is covered by forest

1,300

Years – the age of the oldest tree in Pirin



130,000

People get vital resources from Pirin National Park

48%

Of the Pirin National Park territory opened recently for construction by government



Working to sustain the natural world for people and wildlife

together possible panda.org