
Talladh-a-Bheithe Wind Farm Proposal Review of impacts on wild land

A report by the Wildland Research Institute for The John Muir Trust

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Executive summary

This report has been prepared on behalf of The John Muir Trust by the Wildland Research Institute. The report assesses the potential impacts of the proposed Talladh-a-Bheithe Wind Farm proposal in terms of wild land as defined by Scottish Natural Heritage (SNH) and highlighted in Scottish Planning Policy (SPP2) and the National Planning Framework (NPF3) all as finalised on 22 June 2104. The report additionally addresses the relevant points raised by Pegasus Planning Group acting on behalf of Eventus BV and corrects errors made in their submissions included within the application Environmental Statement

A final map of wild land areas was developed by Scottish Natural Heritage and published in June 2014 along with the SPP2 and NPF3. This map supersedes SNH's earlier maps identifying search areas for wild land in 2002 and core areas of wild land in 2013. The new map has received cross-party and ministerial support and so can be regarded as the final version. A total of 42 wild land areas are identified covering just under 20% of the land area of Scotland.

Although wild land and the areas identified by the SNH mapping is not a statutory designation, Paragraph 200 of the SPP states wild land is *"very sensitive to any form of intrusive human activity and have little or no capacity to accept new development"* and that *"Plans should identify and safeguard the character of areas of wild land"*.

The proposed Talladh-a-Bheithe wind farm lies inside wild land area number 14 (Rannoch-Nevis-Mamores-Alder) as identified on the SNH 2014 map of wild land areas. Analyses developed as part of this report show that a development of the scale proposed (twenty four 125m high turbines and associated infrastructure) would have a significant adverse impact on the qualities of this area of wild land, with the likely outcome that if the development goes ahead the area of wild land in the vicinity would be reduced by approximately **9,520ha** or **8.1%**. These analyses are based on the same approach, methods, data and techniques used by SNH in developing the 2014 map of wild land areas.

Additional analyses are carried out to assess the wider national context of the proposal in regard to visibility of wind farms from wild land areas and further reduction of the area of Scotland currently without visual impact from industrial wind turbines. The Rannoch area is one area which is as yet free from visual impact. These analyses show that construction of the Talladh-a-Bheithe wind farm, should it be consented, would impact significantly on this "visual impact free" area and further reduce the "wind farm free" area across Scotland as a whole by **68,686ha** or **1.9%**.

1. Introduction

1.1 This report has been prepared on behalf of The John Muir Trust. The report provides an overview of the mapping methods used to define areas of wild land in Scotland and reviews the status of wild land in the vicinity of the proposed development. The report assesses the potential impacts of the proposed Talladh-a-Bheithe Wind Farm proposal by Eventus BV and the estate owners in terms of wild land as defined by Scottish Natural Heritage (SNH) and highlighted in Scottish Planning Policy (SPP2) and the National Planning Framework (NPF3) as finalised on 22 June 2104. The report additionally addresses the points raised by the planning consultants acting on behalf of Eventus BV, Pegasus Planning Group (PPG), and corrects the errors made in Appendix 7.4 technical Representation Note (*Review of SNH Potential Core Areas of Wild Land*) of the Environmental Statement.

1.2 The SPP is *"a statement of Scottish Government policy on how nationally important land use planning matters should be addressed across the country... As a statement of Ministers' priorities the content of the SPP is a material consideration that carries significant weight, though it is for the decision-maker to determine the appropriate weight in each case."*¹

1.3 Although wild land is not a statutory designation, Paragraph 200 of the SPP states: *"Wild land character is displayed in some of Scotland's remoter upland, mountain and coastal areas, which are very sensitive to any form of intrusive human activity and have little or no capacity to accept new development. Plans should identify and safeguard the character of areas of wild land as identified on the 2014 SNH map of wild land areas."*²

1.4 SPP goes on to say that: *"In areas of wild land... development may be appropriate in some circumstances. Further consideration will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation."*³

1.5 While recognising that onshore wind will continue to make a significant contribution to Scotland's power generation capacity, the Scottish Government in NPF3 are clear that they do not wish to see wind farm development in either National Parks nor National Scenic Areas. In addition, NPF3 states that: *"Scottish Planning Policy sets out the required approach to spatial frameworks which will guide new wind energy development to appropriate locations, taking into account important features including wild land."*⁴

¹ Page 2, Para ii, Scottish Planning Policy (June 2014)

² Page 47, Para 200, Scottish Planning Policy (June 2014)

³ Page 49, Para 215, Scottish Planning Policy (June 2014)

⁴ Page 34, Para 3.23, National Planning Framework 3 (June 2014)

1.6 Scottish Natural Heritage published a new map of wild land areas in June 2014. This supersedes the earlier maps which identified Search Areas for Wild Land (SAWL) in 2002, and the Core Areas of Wild Land (CAWL) in 2013⁵. This map is based on a rigorous, robust and repeatable methodology based on the tried and tested methods using in mapping wildness in the Cairngorm National Park⁶ and the Loch Lomond and the Trossachs National Park⁷. The new wild areas map was published to accompany the final versions of the SPP2 and NPF3 in June 2014 and has both cross-party and ministerial support.

1.7 The report examines the Talladh-a-Bheithe wind farm proposal in the context of its potential and likely impacts on wild land areas. This is supported by additional mapping carried out by WRi using compatible and complementary techniques to show how the proposed development would reduce the total area of wild land area 14 (Rannoch-Nevis-Mamores-Alder) and how the proposed development would significantly compromise the wild land quality and values in this and surrounding wild land areas. A new national wind farm visual impact and landscape capacity map is presented as additional evidence to show how the proposed development would significantly impact on an area that is currently free from visual impact from wind turbines.

1.8 The report also considers PPG's review of the SNH wild land mapping process and addresses the issues raised therein. In doing so, the report corrects a number of errors made by PPG in their assessment of wild land in the vicinity of the Talladh-a-Bheithe proposal.

1.9 This report has been prepared by the Wildland Research Institute (WRi), an independent academic institute with specialist knowledge in wild land, geographical information systems (GIS) and landscape assessment⁸. WRi have detailed, in-depth knowledge of the wild land mapping process undertaken by SNH. WRi and the report's principal author are the originators of the original wild land mapping methodology developed for the two Scottish National Parks^{9,10} and have acted as technical advisors to SNH during the original Phase I mapping process¹¹. In addition, WRi have been contracted, together with partners Alterra and PAN Parks, by the European Union Environment Agency (EEA) to extend the methodology to the whole of the Europe^{12,13}. This approach has also been adopted in a modified form for use in mapping wilderness character by the US National Park

⁵ <http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-policy-and-guidance/wild-land/mapping/>

⁶ <http://www.geog.leeds.ac.uk/groups/wildland/Cairngorm2008.pdf>

⁷ <http://www.lochlomond-trossachs.org/looking-after/wildness-study-in-the-loch-lomond-the-trossachs-national-park-2011/menu-id-414.html>

⁸ <http://www.wildlandresearch.org>

⁹ <http://www.geog.leeds.ac.uk/groups/wildland/Cairngorm2008.pdf>

¹⁰ <http://www.lochlomond-trossachs.org/looking-after/wildness-study-in-the-loch-lomond-the-trossachs-national-park-2011/menu-id-414.html>

¹¹ Carver, S., Comber, A., McMorran, R., & Nutter, S. (2012). A GIS model for mapping spatial patterns and distribution of wild land in Scotland. *Landscape and Urban Planning*, 104(3), 395-409.

¹² Europe's ecological backbone: recognising the true value of our mountains. EEA Report No 6/2010

¹³ Wilderness register and indicator for Europe Final report 2013 (draft) Contract N^o:

07.0307/2011/610387/SER/B.3

Service within national park wilderness areas in the United States¹⁴¹⁵. WRI are also the authors of the much cited report on "The Status and Conservation of Wild Land in Europe" commissioned by the Scottish Government¹⁶.

¹⁴ Tricker, James; Landres, Peter; Dingman, Sandee; Callagan, Charlie; Stark, John; Bonstead, Leah; Fuhrman, Kelly; and Steve Carver. 2012. Mapping wilderness character in Death Valley National Park. Natural Resource Report NPS/DEVA/NRR-2012/503. National Park Service, Fort Collins, Colorado. 82p.

¹⁵ Carver, Steve; Tricker, James; and Peter Landres. 2013. Keeping it wild: mapping wilderness character in the United States. *Journal of Environmental Management*, 131 (2013) 239-255. doi:10.1016/j.jenvman.2013.08.046

¹⁶ Fisher, Mark; Carver, Steve; Kun, Zoltan; Arrell, Katherine and Mitchell, Gordon. A review of the status and conservation of wild land in Europe. Report prepared for the Scottish Government, November 2010. <http://www.scotland.gov.uk/Topics/Environment/Countryside/Heritage/wildland>

2. Defining wild land and approaches to mapping

2.1 The SNH policy document "Wildness in Scotland's Countryside" (2002) defines wild land as those *"parts of Scotland where the wild character of the landscape, its related recreational value and potential for nature are such that these areas should be safeguarded against inappropriate development or land-use change."*¹⁷ SNH go on to outline an approach to the identification of wild land recognising that the physical features which contribute to the experience and perceptions of wildness (and thereby to the identification of wild land) can be distilled into the following attributes:

- a high degree of perceived naturalness in the setting, especially in its vegetation cover and wildlife, and in the natural processes affecting the land;
- the lack of any modern artefacts or structures;
- little evidence of contemporary human uses of the land;
- landform which is rugged, or otherwise physically challenging; and
- remoteness and/or inaccessibility.¹⁸

2.2 The connection between physical attributes such as terrain, distance and vegetation, with how people perceive wildness in the landscape is key to the successful mapping of wild land. SNH recognise the importance of this link, stating that the perceptual responses evoked by these physical attributes (listed above in 2.1), the following are often recognised:

- a sense of sanctuary or solitude;
- risk or, for some visitors, a sense of awe or anxiety, depending on the individual's emotional response to the setting;
- perceptions that the landscape has arresting or inspiring qualities; and
- fulfilment from the physical challenge required to penetrate into these places.¹⁹

2.3 SNH go on to recognise that *"these factors are less readily assessed than the physical factors, because they are less tangible, being dependent on the perceptions of the individual... The degree to which people identify all the physical attributes in an area and the extent of their emotional responses will vary according to their experience of wild places, and to their awareness of and sensitivity to the landscape they are in. The intrinsic quality of the setting will also weigh high in people's responses, such that, in some places of quite limited extent, there can be an intense response to its wild and natural character"*.

2.4 In paragraph 7, SNH state: *"The identification of wild land will depend on all the physical attributes being present. To these can be added an extent of area sufficient to encompass the physical attributes, and to provide an appropriate scale of setting to evoke the full*

¹⁷ Page 8, Para 34, SNH (2002) Wildness in Scotland's Countryside. Policy Statement No. 02/03.

¹⁸ Annex 1, Para 3, SNH (2002) Wildness in Scotland's Countryside. Policy Statement No. 02/03.

¹⁹ Annex 1, Para 4, SNH (2002) Wildness in Scotland's Countryside. Policy Statement No. 02/03.

range of perceptual responses."²⁰ However, in no place do they outline specific criteria to be met or state to what extent wild land depends on the degree of wildness in each of the attributes describing wild land. Rather, SNH suggest in paragraph 9 that: *"all the physical attributes must be present and be well expressed in an area; all the perceptual attributes should be identifiable to some degree; and where detracting features exist they should be localised, their cumulative effects on the sense of wildness enjoyed by visitors should be limited, and there should be potential for enhancement."*²¹

2.5 The physical attributes to be used in the identification of wild land are expanded on in the table spanning pages 15 and 16 of Annex 1 of the policy statement. This table lists both the main (physical) criteria used to describe these attributes, but also gives further interpretation of these in regard to how they are likely to influence people's perceptions of wildness in the landscape setting.

2.6 Finally, SNH provide the Search Areas for Wild Land (SAWL) map. It is noted that this map was never intended to be used as a definitive map, rather as a starting point for further, more rigorous mapping work using the best available data and methods. It is worth quoting paragraph 13 verbatim as this makes the point very clear: *"Its [the SAWL map] purpose is not to delimit wild land, but to act as a starting point for review of where the main resource of wild land is most likely to be found. It is an incomplete map which does not identify all of the smaller areas of land which might meet the criteria, say, on the isolated west and north coasts, or on the coast of some of the larger islands. Nor does it identify wild and uninhabited islands, and some small areas in southern Scotland may merit inclusion. It includes land which is known to have detracting features, say roads or forestry plantations, and it also includes some land formerly of evident wild land quality, but now of less significance on account of major impairment – say, in the glens affected by major hydro-power reservoirs. At this stage, then, this is no more than a search area map, prepared for debate with other parties, but it is thought to include most of the significant and valued areas of wild land."*²²

2.7 While the 2002 SNH policy statement provides the basis for subsequent mapping work, it does not provide the exact methodology, rather an indication that the approach adopted might be based on a "simple scoring system" such as has been used successfully in the development of the Australian National Wilderness Inventory²³ and the Human Footprint/Last of the Wild²⁴. As such SNH supported two feasibility studies based around mapping wildness in the Scottish National Parks and, in recognising the difficulties surrounding varied perceptions of wildness and the interpretation of physical attributes, also supported two public perception surveys, one in 2007 (reporting in 2008)²⁵ and one in 2011 (reporting in 2012)²⁶.

²⁰ Annex 1, Para 7, SNH (2002) Wildness in Scotland's Countryside. Policy Statement No. 02/03.

²¹ Annex 1, Para 9, SNH (2002) Wildness in Scotland's Countryside. Policy Statement No. 02/03.

²² Annex 1, Para 13, SNH (2002) Wildness in Scotland's Countryside. Policy Statement No. 02/03.

²³ National Wilderness Inventory's *Handbook of Procedures, Content and Usage*, Second Edition, May 1995

²⁴ Sanderson, E. W., Jaiteh, M., Levy, M. A., Redford, K. H., Wannebo, A. V., & Woolmer, G. (2002). The Human Footprint and the Last of the Wild. *BioScience*, 52(10), 891-904.

²⁵ SNH Commissioned Report No.291 Public Perceptions of Wild Places and Landscapes in Scotland (ROAME No. F06NC03) James Fenton Scottish Natural Heritage.

²⁶ Public Perception Survey of Wildness in Scotland. Report for Loch Lomond & The Trossachs National Park Authority, Cairngorms National Park Authority & Scottish Natural Heritage in Association With Research Now July 2012.

2.8 The Scottish national wildness map has been developed by SNH based on an up-scaling of the National Parks' methodology. This has inevitably involved some modifications. These are outlined briefly below and the differences in respect to the original National Park mapping highlighted. The SNH approach has been to map wildness in three phases:

- Phase 1: An equally weighted multi-criteria GIS mapping of those physical attributes of wildness as defined in the 2002 SNH policy document based on practical interpretations of how these attributes affect people's perceptions of wildness to map spatial variations and patterns in wildness on a relative scale from least wild to most wild. This essentially mirrors the methodology and techniques developed for mapping wildness in the two National Parks by WRi with some minor modifications to the data used and resolution to allow up-scaling across the whole of the country. These mainly concern the use of coarser resolution models and the omission of selected datasets which would have been difficult to source and/or validate at the national scale.
- Phase 2: A statistical classification and grouping areas from the resulting Phase 1 map based on Jenks Natural Breaks Optimisation to define areas with high levels of wildness according to all four attributes and application of differing size thresholds north and south of the Highland Boundary Fault. This differs from the National Parks' mapping only in that a different statistical method is used to arrive at the classification of the wildness areas. In the National Park mapping, classifications for the Phase 1 wildness quality map was performed using fuzzy classification techniques²⁷.
- Phase 3: A simplification of the GIS-derived mapping in Phase 1 and 2 using lines drawn at 1:50,000 scale to align the wild land area boundaries with recognisable features on the ground such as rivers, lochs, ridges, etc. and take into account local features and recent development consents. This phase is similar to that used by the two Scottish National Park authorities whereby the defined boundaries of wild areas are informed by the Phase 1 and 2 mapping and the additional expert knowledge of Park staff.

2.9 There has been open consultation on the SNH mapping process at two principal stages: the publication of the Phase 1 map and methodology in February 2012, and the publication of the CAWL map in March 2013 linked to the consultation process for SPP and NPF3. A total of 16 responses were received for the Phase 1 consultation with responses from local authorities, NGOs, experts/professionals and renewable energy interests²⁸. Many of the responses to the main SPP/NPF3 consultation referred to the CAWL map and the mapping process, such that the Scottish Government asked SNH to undertake further consultation just on the mapping process itself at the end of 2013. A total of 410 responses were received with 136 representing groups or organisations including 15 local authorities and related organisations, 66 businesses and 40 third sector organisations. A total of 274 responses came from individuals including public and politicians²⁹. An

²⁷ Comber, A., Carver, S., Fritz, S., McMorran, R., Washtell, J., & Fisher, P. (2010). Evaluating alternative mappings of wildness using fuzzy MCE and Dempster-Shafer in support of decision making. *Computers, Environment and Urban Systems*, 34(2), 142–152.

²⁸ SNH Analysis of responses on Phase 1 wildness mapping. April 2012.

²⁹ SNH Core Areas of Wild Land 2013 Map: Analysis of consultation responses. February 2014.

independent analysis of the consultation responses was also carried out on behalf of the JMT³⁰. A summary of the responses shows that 80% of respondents back the map with 14% in opposition and 6% remaining neutral. Out of the 14% in opposition it is worth noting that this included 9 individuals and 10 not-for-profit organisations but the greater majority (40) of those finding against the map were businesses allied to the renewable energy industry and land management. WRI submitted its own response focusing on the methodological aspects of the mapping process. This is included in Annex 1. SNH responded in detail to all the comments from both consultations and made changes to the data and methodology used where appropriate in developing the final map of wild land areas.

2.10 The final map of wild land areas was published in June 2014 along with the final SPP2 and NPF3 documents. This map supersedes SNH's earlier maps identifying search areas for wild land in 2002 and core areas of wild land in 2013. The new map has received cross-party and ministerial support and so can be regarded as the final version. A total of 42 wild land areas are identified covering just under 20% of the land area of Scotland. All the maps and details of the mapping process and underpinning policy documents can be found on the SNH web pages³¹.

³⁰ <http://www.jmt.org/news.asp?s=2&cat=Campaigning&nid=JMT-N10892>

³¹ SNH Mapping Scotland's wildness and wild land <http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-policy-and-guidance/wild-land/mapping/>

3. Potential impact on wild land

3.1 The proposed Talladh-a-Bheithe wind farm lies inside wild land area number 14 (Rannoch-Nevis-Mamores-Alder) as identified on the SNH map of wild land areas (June 2014). It should be obvious even without further analysis and consideration that a development of the scale proposed (twenty four 125m high turbines and associated infrastructure) would have a significant adverse impact on the qualities of this area of wild land, with the likely outcome that if the development goes ahead the area of wild land in the vicinity would be considerably reduced. In addition, the development would place a large wind farm into one of the few areas remaining in Scotland without this kind of development. The purpose of this section of the report, having outlined the mapping process used to arrive at the 2014 map of wild land areas, is to demonstrate the level of impact of the proposed development on wild land and the surrounding landscape.

Potential impact of the Talladh-a-Bheithe wind farm of wild land attributes

3.2 The proposed development at Talladh-a-Bheithe would impact significantly on at least three out of the four wild land attributes used to map the spatial distribution and patterns of wild land quality across Scotland. These are perceived naturalness of the land cover, absence of modern human artefacts, and remoteness from mechanised access. Rugged and challenging nature of the landscape would remain largely unaffected.

3.3 Perceived naturalness of the land cover would be impacted by the extent of the ground works required to develop a wind farm of this scale. Upgrading of access roads, digging of borrow pits, construction of crane pads, compounds and associated buildings would all leading to large scale ground disturbance in the vicinity of the site. Naturalness values of affected cells would be reduced from 4 or 5 to 1. While the spatial pattern of disturbance will be limited to the site itself and access roads, this would lead to localised reduction in the mapped perceived naturalness of land cover attribute. The maps in Figures 3.1 and 3.2 are based on the same data and methods used by SNH in the Phase 1 mapping process and illustrate the perceived naturalness of the proposed development site before and after development. Figure 3.3 highlights the degree of change in the perceived naturalness of land cover attribute should the development be consented.

3.4 Absence of modern human artefacts would be the most heavily impacted of the Phase 1 mapping attribute layers. The presence of twenty four 125m high wind turbines and associated access roads and infrastructure within an area of wild land would have a significant impact on the visual integrity of the landscape in terms of perceived wildness. The ZTV for the proposed development is extensive and the turbines would be visible from inside the core of wild land area 14, most notably from the summit, southern peaks and flanks of the Ben Alder plateau. The proposed

development would also be highly noticeable from other areas inside wild land area 14 including large areas of Rannoch Moor and the Rannoch Forest, as well as the Talla Bheith Forest itself. The proposed development would also be visible from within large tracts of wild land area 10 (Braedalbane-Schiehallion) along the Schiehallion-Carn Mairg ridge line. The summits of several Munros would also be affected including Ben Alder (and its satellite peaks of Sron Bealach Beithe, Beinn Bheòil, Sron Coire na h-Iolaire), Beinn Udlamain, Sgairneach Mhòr, Schiehallion, Carn Mairg, Meall Garbh, Carn Gorm, Meall Buidhe, Beinn Chreachain, Beinn Achaladair, Carn Dearg, Sgòr Gaibhre and Sgòr Choinnich. A number of lower summits including several Grahams and Corbetts would also be impacted with views of the turbines. A full list of summits potentially impacted and their distance from the proposed development is given in Table 3.1. Figures 3.4 and 3.5 show the absence of modern human artefacts before and after development, respectively. Again, these maps are drawn using the same data and methods used by SNH in the original Phase 1 mapping. Figure 3.6 highlights the degree of change in the absence of modern human artefacts layer should the proposed development be consented.

3.5 The rugged and challenging nature of the terrain attribute would largely be unaffected by the development. No maps are presented of this attribute.

3.6 The remoteness from mechanised access attribute would be affected by the changes to the access roads associated with the proposed development. Whilst not public roads accessible to public vehicles, the tracks could be used by the public on mountain bikes and so would have a localised impact on reduced remoteness of the area in the immediate vicinity of the site. This is shown in Figures 3.7 and 3.8 which illustrate the remoteness from mechanised access around the proposed development both before and after access roads are built. Again, these maps are drawn using the same data and methods used by SNH in the original Phase 1 mapping. Figure 3.9 highlights the degree of change in the remoteness from mechanised access layer should the proposed development be consented.

3.7 The current Phase 1 wildness map for the landscape around the Talladh-a-Bheithe wind farm proposal is shown in Figure 3.10. The three modified attribute layers (perceived naturalness of land cover, absence of modern human artefacts and remoteness from mechanised access) are combined with the fourth unchanged attribute of rugged and challenging nature of the terrain to give a new Phase 1 wildness map for Scotland that includes the modelled impacts from the Talladh-a-Bheithe development and shown for the area up to 30km from the proposed turbines. This is shown in Figure 3.11. The four attribute maps are combined by a simple un-weighted multi-criteria overlay in the same way as the SNH Phase 1 mapping. This can then be compared to the current Phase 1 wildness map in Figure 3.10. Figure 3.12 highlights the degree of change in the spatial distribution and patterns of wildness should the proposed development be consented.

Reduction in wildness

3.8 Relative reductions in wildness are predicted and shown in Figures 3.11 and 3.12 above by following and repeating the SNH Phase 1 mapping methodology for the proposed development using the same data and the same techniques to enable direct comparison. It can be seen that the greatest impact is, as expected, in the immediate vicinity of the proposed site but extends up to the north western skyline with Sgòr Choinnich, Meall a Bhealach, Beinn a Chumhainn and Ben Alder, more or less filling the Cam Chriochan basin. This is perhaps the area of greatest significance in terms of impact on core of wild land area 14 (Rannoch-Nevis-Mamores-Alder) with the proposed development being easily visible from the summit and southern flanks of the Ben Alder plateau. There are smaller patches of significant impact at greater distance along the ridge south of Loch Rannoch where this faces onto the proposed development site wherein the majority of turbines will be in full view.

3.9 The reduction in total wild land area in the mapped wild land areas impacted by the proposed development can be estimated using the new Phase 1 map in Figure 3.11 as a basis for repeating the SNH Phase 2 and Phase 3 mapping. The current Phase 2 classes are shown in Figure 3.13, while the new Phase 2 classes drawn using the new Phase 1 map from Figure 3.10 are shown in Figure 3.14. These maps are drawn using the same data and methods used by SNH in the original Phase 2 mapping. Figure 3.15 highlights the degree of change in the spatial distribution and patterns of wild land classes should the development be consented.

3.10 Repeating the Phase 3 mapping to show the overall impact on the wild land areas most affected (numbers 14 and 10) is not possible here with 100% certainty since the drawing of the Phase 3 boundaries involved an element of input from SNH staff. However, the grouping of wild land classes appropriate for the area and results from repeating the Phase 2 mapping can be achieved following the guidelines from SNH and using local knowledge, and the wild land area boundaries redrawn with the proposed development in place. The map in Figure 3.16 shows the estimated new boundary for the wild land areas in the vicinity of the proposed development should consent be given, together with the estimated area of change. Overall, it is estimated that should the proposed development go ahead, the total area of wild land in area 14 (Rannoch-Nevis-Mamores-Alder) could be reduced by approximately 9,520ha or 8.1%.

The wider context

3.11 In order to complete the picture of the potential impact on wild land from the proposed Talladh-a-Bheithe wind farm it is necessary to look at the proposal in the wider context of onshore wind farm developments and the pattern of wild land across the whole of Scotland. Figure 3.17

shows the current pattern of wind farm footprints including built, consented, application and scoping phase sites in the context of the 2014 map of wild land areas. A number of consented and proposed developments raise cause for concern in terms of their overlap and adjacency to mapped wild land areas. In the case of the Talladh-a-Bheithe proposal it can be seen that the site footprint lies almost entirely within wild land area 14 (Rannoch-Nevis-Mamores-Alder). As shown in Figure 3.16 this is predicted to have a significant impact on this particular wild land area.

3.12 Given the high level of visual impact associated with large modern wind turbines, especially in terms of their negative impacts on perceptions of wildness it is interesting to look at the Talladh-a-Bheithe wind farm proposal and other proposed developments within and adjacent to the 2014 map of wild land areas in terms of their likely visual impact. Figure 3.18 shows the visibility of the 2014 wild land areas from a 125m high vantage point across the whole of Scotland. In effect, this map shows the potential visual impact from a 125m tall wind turbine built anywhere in Scotland on any of the mapped wild land areas within a 30km search radius. Figure 3.19 simplifies this map into a series of percentage classes in 10% categories. Turbines built in the 0% class will not be visible from the 2104 mapped wild land areas. Turbines built in the 100% class will only be visible from wild land areas. As can be seen from Figure 3.19, the Talladh-a-Bheithe wind farm falls into the 100<90% class boundary, again further indicating the severe degree of visual impact on wild land associated with this development.

3.13 An important aspect of the Talladh-a-Bheithe wind farm proposal is that, if consented, this would be the first large scale wind farm in the area and as such represents an even more significant visual impact since the current landscape is free from visual impact of this nature. In order to illustrate this point it is necessary to map the ZTVs for all currently built wind farms in Scotland. This is shown in Figure 3.20. Landscape free from visual impact from wind turbines is highlighted including the Rannoch area. As can be seen from this map, areas free from visual impact from industrial scale wind farms are becoming increasingly scarce with turbines now being visible from over 46% of Scotland's landscape. The Rannoch area is one area which is as yet free from visual impact from industrial scale wind turbines. The construction of the Talladh-a-Bheithe wind farm, should it be consented, would further reduce the "wind farm free" area across Scotland as a whole by 68,686ha or 1.9% as highlighted in Figure 3.21.

4. Corrections to critique of SNH wild land mapping

4.1 Pegasus Planning Group (PPG) working on behalf for Eventus BV and the Talladh-a-Bheithe estate owners have produced a lengthy Technical Representation Note (TRN) critiquing the wild land mapping approach adopted by SNH and the resulting SAWL and CAWL maps. PPG comment extensively on the Phase 1, 2 and 3 mapping methodology. This is done in an attempt to question the rationale and justification for including the Talladh-a-Bheithe estate in wild land area 14 (Rannoch-Nevis-Mamores-Alder) and undermine the SNH wild land mapping in general. This section of this report is aimed at addressing some of the general comments and criticism of the SNH wild land mapping and provide corrections to errors and misunderstandings in the PPG TRN document.

4.2 As a general point, it is worth stating from the outset that PPG's TRN was written in July 2013 after the CAWL map was published by SNH in March 2013 but, critically, before the consultation on the 2013 CAWL map and subsequent changes and modifications made prior to the publication of the final map of wild land areas in June 2014 alongside the SPP2 and NPF3 documents. The new 2014 map of wild land areas addresses a number of the issues raised during the December 2013 consultation process, including some of those raised by PPG and other representatives of the renewable energy industry. Nevertheless, it should be noted that the current 2014 map of wild land areas has been accepted by the Scottish Government and has both ministerial and cross-party support. While not a statutory designation, the 2014 map of wild land areas is embodied within the SPP and NPF3 and "*as a statement of Ministers' priorities the content of the SPP is a material consideration that carries significant weight.*"³² In this respect, the critical comment on the SAWL and CAWL mapping made by PPG in the context of defending the Talladh-a-Bheithe wind farm proposal can effectively be disregarded. Nonetheless, it is still worth addressing the key criticisms raised by PPG and correcting errors and misunderstandings where they occur.

Specific corrections

4.3 Throughout their TRN, PPG make conflicting references to lack of weighting of the attribute layers in the Phase 1 mapping work, especially in relation to the original mapping work carried out for the Cairngorms National Park and the effect of differing cells sizes and view distances in respect to the absence of modern human artefacts layer.

4.4 While weighting schemes were explored and developed by the work carried out in 2007/2008 for the CNPA and later for the LLTNP in 2011/2012 both Parks actually opted to use an un-weighted model in their final analysis of wild land areas. This decision was based on the reasoning that neither Park Authority wanted the results of the mapping to be biased by individual or group opinion about

³² Page 2, Para ii, Scottish Planning Policy (June 2014)

the relative importance or priority given to individual wildness attributes, preferring the attributes to have equal weight in the final analysis thereby avoiding any question of possible bias. A considerable effort was made by SNH and the two National Parks in 2007/2008 and again in 2011/2012 to survey the Scottish population and determine a useable set of weights that could be confidently applied to the Phase 1 mapping process. The first public perception survey, while generating some helpful information on the degree of public concern and support for the protection of wild land, was largely un-useable in terms of generating weights suitable for mapping purposes due to inconsistencies in the survey design³³. The second public perception survey carried out in 2011/2012 with closer support from mapping experts and was thus more successful in generating some meaningful and useable weights. Nonetheless, both National Parks did not use these in the final wildness maps adopted for planning purposes, rather seeing the results as an interesting exercise in evaluating the robustness of the resulting maps.

4.5 The use of different distances and cell sizes in the GIS-based analysis of visual impact from modern human artefacts is based on findings in the peer-reviewed scientific literature wherein most human features are found to be discernible up to 15km in good visibility, but extremely large features such as wind turbines are discernible as far as 30km distant³⁴. Different cell sizes are applied as a matter of practical expediency to this analysis since running the viewshed analyses at 50m resolution with maximum view distances up to 30km would be extremely time consuming even using the rapid voxel viewshed software supplied by the University of Leeds. In addition, GIS software and algorithms are fully able to cope with multiple cell sizes, while any generalisation involved in analysing the wind turbine viewsheds at 100m, rather than the 50m as used for other human features, is more than compensated for by the size and scale of these features.

4.6 PPG appear to misunderstand how the voxel viewshed software works and what it is capable of. This is described in the peer-reviewed literature^{35,36}, in online articles^{37,38} and in the reports written to accompany the work carried out in mapping wildness in the two national parks^{39,40}. No weighting has been applied to any of the features analysed by this method, rather the maximum search distance for the viewshed analysis is simply extended for wind turbines according to the work of Bishop (2002). The voxel viewshed technique is not a binary viewshed tool like those provided by most proprietary GIS and LVIA packages and used in standard ZTV mapping. The assessment of absence of modern human artefacts is perhaps the most quantitative part of the Phase 1 methodology and is

³³ <http://www.geog.leeds.ac.uk/groups/wildland/Cairngorm2008.pdf>

³⁴ Bishop, I. (2002). Determination of thresholds of visual impact: The case of wind turbines. *Environment and Planning B*, 29(5), 707–718.

³⁵ Carver, S., Comber, A., McMorrin, R., & Nutter, S. (2012). A GIS model for mapping spatial patterns and distribution of wild land in Scotland. *Landscape and Urban Planning*, 104(3), 395-409.

³⁶ Carver, Steve; Tricker, James; and Peter Landres. 2013. Keeping it wild: mapping wilderness character in the United States. *Journal of Environmental Management*, 131 (2013) 239-255. doi:10.1016/j.jenvman.2013.08.046

³⁷ Carver, Steve and Washtell, Justin. 2012. Real-time visibility analysis and rapid viewshed calculation using a voxel-based modelling approach. Proc. GISRUK 2012. Lancaster.

³⁸ Carver, Steve and Markieta, Michael. 2012. No High Ground: visualising Scotland's renewable energy landscapes using rapid viewshed assessment tools. Proc. GISRUK 2012. Lancaster.

³⁹ <http://www.geog.leeds.ac.uk/groups/wildland/Cairngorm2008.pdf>

⁴⁰ <http://www.lochlomond-trossachs.org/looking-after/wildness-study-in-the-loch-lomond-the-trossachs-national-park-2011/menu-id-414.html>

far more advanced than any of the LVIA methodologies used by the landscape planning industry. The voxel viewshed model is based on determining the proportion of the 360 degree view that is occupied by the feature of interest based on the vertical area visible determined from a full 3D voxel-based terrain model while taking distance decay into account. As an example, a 125m tall wind turbine viewed at 15km distance might occupy a tiny fraction of the full 360 degree panorama, whereas a small, single room bothy viewed from just a few metres away will occupy a significant proportion of the landscape panorama despite its diminutive size. The only weights applied to the features whose visibility is being calculated, therefore, are the actual size of the feature itself and its distance from the observer. Thus, even though the maximum search distance for wind turbines is extended to an additional 15km beyond that of other human features no extra weighting is implied or involved. This is a far more powerful and a much more realistic approach to visual impact assessment than the standard binary viewshed algorithms provided in proprietary GIS and LVIA packages.

4.7 PPG correctly question the use and specification of thresholds in the Phase 1 and 2 mapping process. Thresholds are required in any model of this nature, and while it is sensible to question the definition of the exact thresholds used, any quantitative GIS model, whether discrete or fuzzy, will rely on the careful definition of appropriate thresholds at some point within their implementation. This is especially true in regard to the final definition of Phase 3 wild land areas based on the information derived from Phase 1 mapping and Phase 2 classification. Effective planning policy requires that a line is drawn on the map at some point. The decision about exactly where the line is drawn is based on the careful juxtaposition of the GIS analyses and spatial aggregations of class 7/8 and 5/6 areas with sensible and recognisable features on the ground such as ridge lines, rivers, lochs, etc. Wherever possible this first version of the Phase 3 map recognises consented developments which will ultimately impact on wild land in the near future.

4.8 The reduction by 50% from the minimum area threshold of 1000ha to just 500ha for wild land areas south of the Highland Boundary fault is done in recognition of the value of smaller pockets of wild land in close proximity to the cities and towns in central belt. These areas are, as such, correctly recognised as being of high value in terms of ease of access to large urban populations and so deserving of inclusion in the national map of wild land areas despite being of smaller size.

4.9 PPG criticise the SNH mapping methodology for being mainly desk-based and lacking field verification. It should be noted that field verification is currently on-going under a separate SNH contract. This work will be published in the near future and will serve to verify and underpin the 2014 map of wild land areas. It is expected that this field verification work will be used to assess individual development proposal and their impacts on wild land.

4.10 PPG regard the 2007 SNH landscape policy and guidance to be deficient in several aspects in regard to wild land. It should be noted that this is general guidance and clearly each case of proposed development visible from within wild land areas will need to be considered on its own individual merits based on scale, context, location and characteristics. Nonetheless, the current Phase 1 methodology for assessing visual impact using the voxel viewshed tool allows each new

development to be quantified in terms of the absolute visual impact on nearby wild land and as such can demonstrate in combination with other factors in the Phase 1 and Phase 2 mapping process just how much the wild land area will be reduced by as shown for the proposed Talladh-a-Bheithe wind farm in section 3 of this report.

4.11 There is criticism in the PPG TRN that suggests a lack of transparency in the development of the SNH wild land maps. While it is recognised that the TRN document was written prior to the December 2013 consultation of the CAWL map and the revisions published in the 2014 map of wild land areas, it should be recognised that the 2014 wild land mapping process has taken several of the issues raised in the consultation process into account and incorporated these into the latest mapping.

4.12 Another criticism raised by PPG is that the current mapping process goes beyond the intent of the 2002 SNH wild land policy statement. While this is true, it ought to be noted that the 2014 mapping is based on the conditions applying in 2014, not 2002, and thus must be seen as the logical development of the 2002 policy statement to meet the needs of the current decade taking into account contemporary patterns in wild land and landscape capacity for development, particularly concerning the obvious and significant impacts of increased renewable energy developments on wild land and wider issues of landscape quality over the last ten years.

4.13 The TRN written by PPG consistently makes reference to the SAWL and compares these against the 2013 CAWL map. The CAWL 2013 have now been superseded by the 2014 Phase 3 wild land map approved by Ministers on 22 June 2014 as noted in section 4.13. The original SAWL map was never intended to be a policy implement, rather was drawn using expert knowledge and judgement for the purposes of identifying very approximately where areas with wild land character might be found purely as a device for focusing future efforts on rigorous assessments of wild land quality and therefore should not be used for critical comparative purposes in evaluating the 2014 wild land areas (or the 2103 CAWL map) in any way. It is in many ways unfortunate that the SAWL map was digitised and made available as a GIS-readable file since planning consultants working for the renewable energy industry have often applied these inappropriately in their proposals for developments like that proposed for Talladh-a-Bheithe.

4.14 PPG express apparent surprise that the boundaries of the 2012 and 2013 CAWL have "expanded" to cover larger areas than the 2002 SAWL. Notwithstanding the point made above in 4.13 that the SAWL were only ever intended as approximate search areas, the focus of the Phase 1, 2 and 3 methodology is to make the mapping of wild land in Scotland more rigorous, robust and repeatable. It was never to explicitly reduce the wild land areas as defined by the SAWL 2002 map, rather the intention has always been to refine them which could involve either expansion or retraction at individual locations.

4.15 PPG list a number of guidance and reference documents used in the preparation of their TRN. It is interesting that no reference is made to any of the peer-reviewed scientific literature on

mapping of wild land or wilderness quality nor any of the literature associated with LVIA specific to wind turbines. This would seem like a serious omission as far as rigor and defensibility is concerned.

4.16 PPG in section 4.11 of their TRN quote SNH Interim Guidance Note Paragraph 2.1.3 as stating that *"if one of the perceptual responses is not present, that location will not be true wild land."* This is now outmoded thinking. Binary analyses like this are not reliable nor are they sufficiently subtle in terms of a fuzzy problem like wild land. We need to recognise that wildness is perceived on a sliding scale and cannot be measured in black and white terms. To this end, the Phase 1 mapping is based around an un-weighted combination of the multiple attributes of wildness such that a lower wildness in one or more attributes does not exclude an area from consideration in the Phase 2 and 3 wild land mapping process.

4.17 PPG express concerns in section 5.5 of their TRN that the combination of Phase 1 attributes and subsequent classification in Phase 2 can lead to overestimation of the quality of wild land around the edge of core areas. The concept of a "de facto apron" of lesser quality wild land around core areas of high quality wild land is a generally accepted concept. Many protected areas have "buffer" zones of marginally-impacted and low intensity land use maintained as such to provide a zone or protection against more intensive/intrusive development (e.g. UNESCO Biosphere Reserves and US Wilderness Areas). While the analyses in Phase 2 and 3 analyses are developed such as to avoid inclusion of Class 5/6 land on its own, where it is included within, around or adjacent to Class 7/8 land its inclusion in the 2014 Phase 3 map is justified as explained in both the concept and method of wild land mapping.

4.18 PPG question in section 5.6 of their TRN whether the adaption and modification of data included in the definition of wildness attributes at the national scale has deviated too far from the tried and tested model developed for the Cairngorm National Park in 2008. This kind of modification is normal in scaling up of models from local to national scales as seen in various wildness mapping projects carried out elsewhere and at different scales.

4.19 At various points throughout the TRN, PPG criticise the SNH Phase 1 methodology for mapping "relative wildness" rather than some measure of absolute wildness (e.g. in section 5.17.1). This represents an incorrect interpretation of the concept of "relative" by PPG. Here it ought to be obvious that the relativity refers to the spatial gradient from least wild to most wild wherein wildness is modelled as "relative" to the wildest and least wild location in Scotland. This is a familiar concept known as the "wilderness continuum" or environmental modification spectrum⁴¹. Therefore the relative wildness of Scotland - as judged by a locations position relative to these two finite fixed points (i.e. the least wild and most wild locations) - and the scaling of the four wildness attributes according to these, yields a continuum of wildness as determined by the distribution and combination of the attributes used to define wildness. The absolute values of such a scale or continuum will inevitably change depending on the spatial scale and location of application. Any area, at any scale, will always have a least and most wild location when mapped using the

⁴¹ Leslie, R. G., & Taylor, S. G. (1985). The wilderness continuum concept and its implication for Australian wilderness preservation policy. *Biological Conservation*, 32, 309–333.

continuum concept, and show a "relative" scale of wildness for all locations in between. For example, Sanderson et al. (2002) map the Human Footprint at a global scale using global scale datasets stored at 1km² resolution using a continuum of human impact, and thus are able to identify "The Last of the Wild" at the wilder end of this spectrum⁴². Scotland doesn't appear in the Last of the Wild map and yet does exhibit discernible variability in human impact in the Human Footprint map. Mapped at a European scale using continental scale datasets the wilderness continuum shows further detail and variability across and within regions and countries. Scotland features prominently in the draft map developed for the EU/EEA Wilderness Register and in part contributes some areas modelled as to be within the top 10% wildest areas in Europe⁴³. Looking only at the UK scale, then Scotland clearly contributes the bulk of the UK's wildest land with very few areas appearing by comparison in England, Wales or Northern Ireland⁴⁴. Looking closer still, variations in wildness are seen within the two National Parks as shown in the mapping work carried out for the Cairngorms National Park⁴⁵ and The Loch Lomond and The Trossachs National Park⁴⁶. Combining the two National Parks' wildness map into one dataset enabled the comparative mapping of wildness between the two and allowed comparisons to be drawn.

4.20 PPG criticise the Phase 1 methodology for double counting of some attributes (e.g. in section 5.17.1). The notion of double-counting in this case only refers to the repeated use of the same dataset to define common features relevant to separate attributes, but these are then mapped in completely different ways to account for their different effects on the four wildness attributes themselves. For example, roads are included in the perceived naturalness of land cover at very local scales (within a 250m radius) where they are large enough to be mapped as "urban" in the 25m CEH LCM2007 data, but also in the absence of modern human artefacts layer where they influence the visual impact on wildness over much larger distances (up to 15km radius). Roads are also included in the remoteness layer where they function as the origin/starting point for journeys into wild land areas. Another example is vegetation. Patterns of vegetation as taken from the 25m CEH LCM2007 dataset are reclassified and averaged over a 250m radius to map perceived naturalness of land cover and are also used as a friction surface to moderate walking speeds in the remoteness from mechanised access layer. This is only correct, and is a key component of the method/wildness mapping approach.

4.21 PPG criticise the mapping work for taking what may be temporary features (such as plantation forest) into account, for example in acting as barrier features in the visibility analyses and high friction land uses in remoteness modelling. This applies to both the Phase 1 mapping and definition of Phase 3 areas. It should be noted that the 2014 map of wild areas is intended to represent the current situation and distribution of wild land with the expectation that this pattern may change in

⁴² Sanderson, E. W., Jaiteh, M., Levy, M. A., Redford, K. H., Wannebo, A. V., & Woolmer, G. (2002). The human footprint and the last of the wild. *Bioscience*, 52(10), 891–904.

⁴³ Wilderness register and indicator for Europe Final report 2013 (draft) Contract N^o: 07.0307/2011/610387/SER/B.3

⁴⁴ The John Muir Trust. Our Essential Wildness. <http://www.jmt.org/vision.asp>

⁴⁵ <http://www.geog.leeds.ac.uk/groups/wildland/Cairngorm2008.pdf>

⁴⁶ <http://www.lochlomond-trossachs.org/looking-after/wildness-study-in-the-loch-lomond-the-trossachs-national-park-2011/menu-id-414.html>

the future. It is intended that the wild land maps be updated at intervals in the future to take into account changes and developments that both reduce and increase patterns in wild land. In this way the expansion and contraction of wild land in Scotland can be monitored and these maps be used to inform strategic thinking on landscape policy.

4.22 PPG correctly point out that at various stages in the Phase 1 mapping, proxies or surrogates are used to map the spatial variability in selected components of the four wildness attributes. This is to be expected in a mapping project of this kind where physical attributes (terrain, vegetation, distance, etc.) are imbued with meaning as to their association with and effects on perceived attributes of wildness (ruggedness, challenge, visual impact, remoteness, naturalness). Much depends on data availability and fitness for purpose. Every care has been taken in identifying data, suites of datasets and mapping processes that can best describe the spatial variation and magnitude of the four attributes of wildness defined in the 2002 SNH Policy Statement. Again, there is naturally some difference in the exact datasets used between the wildness mapping done for the two national parks and the national mapping done by SNH. Some datasets were deemed to be too temporarily variable in nature and therefore were avoided, particular examples being weather and climate, wildlife and location of fish farming activities.

Summary

4.23 PPG raise a number of important points and issues in their TRN of Appendix 7.4 attached to the Talladh-a-Bheithe wind farm proposed environmental statement. All of these can easily be anticipated and in most instances can be addressed with further information and clearer thinking. Several errors and misunderstandings are corrected. A smaller number of issues are left to a matter of opinion. It is clear from public perception surveys and political support that wild land is an important aspect of the Scottish landscape and needs to be protected from inappropriate development. Since the first formal recognition of wild land in NPPG14, SNH have been working towards first developing a policy on wild land and then developing a suitable methodology for mapping wild areas which can be used to inform planning decisions on the ground. From an early stage SNH recognised that mapping wild land would be a delicate balance between physical attributes on the one hand and how these influence the perceived attributes of wildness on the other. SNH have consulted on their mapping work at key stages of its development and used the best available technology and data backed up by advice and assistance from the best experts in the field. They have taken on board comments from a wide range of stakeholders and built these into their mapping where possible and appropriate. The TRN written by PPG on behalf of Eventus BV and the owners of the Talladh-a-Bheithe estate only criticises the SNH mapping of wild land and does not make any constructive suggestions as to how improve the work and proceed further.

4.24 As a result of the rigor of SNH's approach and the high degree of consultation, the mapping work has been in receipt of wide spread support with only a minority expressing opposition. The 2014 map of wild land areas has been accepted by the Scottish Government and has full cross-party and ministerial support. It is linked to and underpins the consideration of wild land issues in the SPP

and NPF3 documents published in June 2014. This fact alone serves to largely invalidate the criticism expressed by PPG since this criticism is now largely out of date and focused on the old SAWL and CAWL maps.

4.25 The mainstay of PPG's criticism and corrections to these can be summarised as follows:

- **Weighting:** PPG are inconsistent in their criticism of the lack of weighting applied to the attribute layers in Phase 1. No weighting was applied in the final analysis of wildness in the two national parks. No weighting is applied to different human features in the absence of modern human artefacts layer, rather a true quantitative assessment of visual impact is given according to distance decay and size of the feature using terrain to determine the portion of the feature visible and its proportion relative to the 360 degree view. Therefore the increase in maximum distance applied to mapping the visibility of wind turbines does not add extra weight to these features, rather recognises the fact that their huge size makes them visible at greater distances. Similarly, a reduced resolution of 100m does not over-generalise the results rather allows the analysis to function within practical means dictated by available computer resources.
- **Double counting:** PPG are inconsistent in their suggestion that attributes are somehow double counted. This is only true as regards the datasets used but each are used in different ways to best represent the different affects they have of perceptions of wildness such as vegetation data being used to represent both naturalness of land cover and as a friction value determining speed of walking in remoteness from mechanised access.
- **Up-scaling:** PPG are critical of how the original methodology and datasets developed for the two National Parks have been modified in up-scaling the approach to a national level. This is natural for any model of this kind as demonstrated by comparisons with global, continental and national scale models of wildness developed elsewhere. SNH have, however, taken every possible step to maintain comparability with the original models developed for the national parks.
- **Thresholds:** PPG question several of the thresholds used in the Phase 1 and Phase 2 mapping process. The application of carefully chosen thresholds is a key part of any spatial model and is essential in drawing lines on maps that can be used for planning and decision making purposes. Some thresholds have clearly been chosen to best represent the situation on the ground as closely as possible and while it is good to be questioning of how they are defined, they are nonetheless defensible in the context of the work carried out.
- **Relativity:** PPG appear to misunderstand the concept of relative wildness. All measures are relative when compared to particular norms or points of reference. In this instance, all locations in Scotland are measured for wildness relative to the extreme points of a continuum of wildness - from least wild to most wild - based on the combination of four attributes of wildness. This continuum needs to be seen in the wider spatial context of global, continental, national and local patterns of wildness.
- **Viewshed modelling:** PPG have no experience with, and therefore do not appear to understand the voxel viewshed model developed by the University of Leeds. As a result a number of erroneous conclusions are drawn about how this works, its capabilities and implications for the effects of distance decay, area of features of interest visible and the

proportion of the panoramic 360 degree view that they occupy. The voxel viewshed model represents the state-of-the-art in LVIA and is used by here by SNH as well as by the national parks and various organisations abroad including the US National Park Service. It produces visual impact assessment for every point in the landscape matrix and is much more advanced than the simple binary viewshed models available in off-the-shelf GIS and LVIA packages.

- Field verification: PPG criticise the lack of field verification for the Phase 1, 2 and 3 mapping process. Field verification is current underway, the results from which will be incorporated into assessing the impacts of proposed future developments.

5. Conclusions

5.1 Mountains, lochs and rugged coastlines are valued hallmarks of Scotland's landscape, providing a major focus for recreation and conservation. These qualities of the Scottish landscape are strongly expressed in areas dominated by natural vegetation, lack of human intrusion from built structures and the rugged and remote nature of the terrain. They are not wilderness in the true sense, but they do possess certain attributes of wildness and so are widely referred to as 'wild land'⁴⁷. These iconic landscapes are closely linked to Scotland's national identity and represent a key draw for visitors. Recent surveys have shown that 91% of Scottish residents believe that wild land is important and needs protection⁴⁸.

5.2 However, despite recognition of their value, Scotland's wild land areas face a growing array of threats including renewable energy, overgrazing, management for grouse and stalking interests and bulldozed hill tracks⁴⁹. Previous studies have shown these factors can impact significantly on an area's wildness and result in a gradual attrition of the wild land resource⁵⁰.

5.3 SNH are world leaders in the development of mapping methodologies applied to identifying wild land areas. This is underpinned by use of the best available data and techniques, supported by expert advice and information from leading academics and practitioners, and developed over more than twelve years of careful research and development. Scotland is the first country in Europe to action the key points arising from the European Parliament Resolution on Wilderness in Europe⁵¹. This includes commissioning a review of wild land protection in Europe⁵² and initiating a national mapping programme. The detail and rigour involved in the SNH Phase 1, 2 and 3 wild land mapping process makes this one of the most robust wildness mapping exercises undertaken anywhere in the world. We would do well to recognise this and support the efforts of SNH and its partners.

5.4 The 2014 map of wild land areas has been accepted by the Scottish Government and has received cross-party and ministerial support. It is linked to and referenced as key supporting information for the SPP and NPF3 documents. The 2014 map supersedes the 2002 SAWL and 2012

⁴⁷ SNH (2002) Wildness in Scotland's Countryside. Policy Statement No. 02/03.

⁴⁸ SNH Commissioned Report No.291 Public Perceptions of Wild Places and Landscapes in Scotland (ROAME No. F06NC03) James Fenton Scottish Natural Heritage

⁴⁹ McMorran, R., Price, M. F., & Warren, C. R. (2008). The call of different wilds: The importance of definition and perception in protecting and managing Scottish wild landscapes. *Journal of Environmental Planning and Management*, 51(2), 177–199.

⁵⁰ Carver, S., & Wrightham, M. (2003). Assessment of historic trends in the extent of wild land in Scotland: A pilot study. Scottish natural heritage commissioned report No. 012 (ROAME No. FO2NC11A).

⁵¹ European Parliament resolution of 3 February 2009 on Wilderness in Europe (2008/2210(INI)) European Parliament. <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P6-TA-2009-0034&language=EN>.

⁵² Fisher, Mark; Carver, Steve; Kun, Zoltan; Arrell, Katherine and Mitchell, Gordon. A review of the status and conservation of wild land in Europe. Report prepared for the Scottish Government, November 2010. <http://www.scotland.gov.uk/Topics/Environment/Countryside/Heritage/wildland>

and 2013 versions of the CAWL. While not a statutory designation, the 2014 map of wild land areas is embodied within the SPP and NPF3 and therefore is a material consideration that carries significant weight. In this respect, the critical comment on the SAWL and CAWL mapping in the context of defending the Talladh-a-Bheithe wind farm proposal can be considered out of date and largely superseded given government and ministerial support for the 2014 mapping.

5.5 The proposed Talladh-a-Bheithe wind farm is located inside one of the 2014 wild land areas (Area 14: Rannoch-Nevis-Mamores-Alder) and therefore cannot fail to impact heavily on this area of wild land. The proposed development would also have a significant visual impact on an adjacent wild land area to the south of Loch Rannoch (10. Breadalbane-Scheihallion) and be visible from the summits of several Munro summits and lesser hills.

5.6 The proposed development would impact significantly on at least three out of the four Phase 1 wild land attributes. Only the Rugged and challenging nature of the terrain attribute would remain unaffected. This inevitably means that the development would have a significant impact on the relative wild land values in both the immediate vicinity of the site boundary in terms of naturalness and remoteness, and much further afield in terms of its visual impact.

5.7 Should the proposed development be consented then it is expected that the total area of wild land area 14 (Rannoch-Nevis-Mamores-Alder) would be reduced by 9520ha, representing an overall reduction amounting to 8.1%.

5.8 The Talladh-a-Bheithe wind farm proposal falls entirely within the 100-90% class in regards potential visual impact on the 2104 map of wild land areas from modern, 125m tall wind turbines indicating the proposed development to have the highest likely impact on mapped wild land areas possible.

5.9 The Talladh-a-Bheithe wind farm proposal is located in an area that is currently free from visual impact from existing wind farms. The rapid development of onshore wind farms over the past decade has placed a consistent pressure on the wild land resource in Scotland and reduced the area without a view of a wind turbine to just a few areas. Should the Talladh-a-Bheithe development be consented and built this would represent a significant impact in the middle of one of these last remaining areas of un-impacted land, reducing the "wind farm free" landscape by 68,686ha or 1.9%.

5.10 The SPP document states that areas of *"Wild land character [are] ... very sensitive to any form of intrusive human activity and have little or no capacity to accept new development. Plans should identify and safeguard the character of areas of wild land as identified on the 2014 SNH map of wild land areas."* Given the acceptance of the 2014 map of wild land areas by the Scottish Government and associated ministerial support as part of SPP and NPF3, the location of the Talladh-a-Bheithe wind farm proposal a wild land area makes this proposal untenable in this respect.

Appendix 1 – SNH Core Areas of Wild Land 2013 Map Response

Q.1. What is your view on the Core Areas of Wild Land 2013 map?

- Wild land is a highly valued and distinctive aspect of Scotland’s culture and countryside that is sensitive to development. Over 90% of Scotland’s population thinks wild land is important and requires protection.
- Informed decisions about protection depend heavily on high quality mapping. The SAWL provided in Annex I of the 2002 SNH policy statement on wild land was only ever intended as a preliminary search map for areas of wild land and should never have been released for use in digital form.
- The results of the Phase I mapping and the Phase II and III identification of core wild land areas represent a tremendous effort and great deal of work on the part of SNH and is to be highly commended.
- The Phase I, II and III mapping of wildness and wild land in Scotland represents the most detailed and rigorous national mapping exercise of its kind in the world to date. Scotland may therefore be seen as a world leader in this field and therefore the work of SNH should be given the fullest support possible.
- The approach for the Phase I mapping is based on proven and accepted methods developed for the Cairngorm National Park and the Loch Lomond and The Trossachs National Park, but has been generalised to facilitate scaling up to map the whole of Scotland. This generalisation is wholly warranted and driven by scale, data availability and computational considerations.
- The Phase II mapping represents a logical, robust and repeatable approach to identifying the core wild land areas from the Phase I continuum map based on wildness and size with a sensible approach to recognising the differences in core areas in both the Highlands and the Lowlands across the Highland Boundary Fault.
- Phase III introduces human input from landscape experts scrutinizing the Phase I and II mapping to makes decisions about the final boundaries presented in the CAWL maps. This is necessary to produce sensible boundaries based on local geographical knowledge and features recognisable on the ground as well as performing a final check for features and anomalous geographies not picked up in the more automated Phase I and II mapping.
- The SAWL should be withdrawn and replaced by the 2013 CAWL map as the basis for informing current and future decisions regarding wild land, its wider protection and proposals impacting upon it.

Q.2. Do you have specific comments on any of the areas of wild land identified?

- Decisions concerning the scale of core wild land areas have had to be made by SNH in the Phase II and III CAWL mapping when looking at the obvious differences between the Highlands and Lowlands of Scotland. It is obvious looking at the Phase I map that the bulk of the wild land resource is located in the Highlands while the Lowlands are relatively under-represented. Considering the concept of relativity that scale and different windows of observation engender, it is important to ensure a representative spread of core wild land areas between both Highlands and Lowlands in a similar fashion to concerted efforts by the Federal agencies to make sure eastern areas of the USA were better represented in the US National Wilderness Preservation System. Therefore the decision to reduce the size threshold for core areas south of the Highland Boundary Fault from 1000ha to 500ha thus ensuring at least some core areas remain within easy reach of the main conurbations of the Central Belt is a logical one, based on the key geographical division represented by the Highland Boundary Fault.

Q.3. Are there any other issues regarding the Core Areas of Wild Land 2013 map, or its preparation, that you would like to raise?

- The scale of mapping covered in the Phase I, II and III maps represents the optimum scale for national level mapping wherein detailed nationally available data can be used in a coordinated fashion using models that are customised and attuned to best suit the national patterns and our understanding of wild land. This is ideal for strategic planning at a national level such as is required in defining the CAWL maps and evaluation of national designations.
- The mapping work carried out by SNH at a national level has used data resolutions of 25m, 50m and 100m to ensure the highest quality results are available at the national scale while ensuring the analysis is practical on the basis of required computational overheads.
- It is recognised at various levels and at various stages in SNH thinking that wildness and wild land are essentially a qualitative concept that will inevitably vary from person to person and between stakeholder groups and organisations. This may be used an argument to say that it is pointless to map it since the concept is too vague to be reliably quantified. The alternative and stronger argument is that wildness and wild land in Scotland's countryside is too valuable a resource not to at least attempt to quantify it and therefore be able to map it sufficient detail and rigor such that it can best be delimited and protected. If left unmapped and unprotected, Scotland's wild land

resource will be at great risk of steady erosion from numerous developments.

- It is clear from the two perception studies carried out in 2007 and 2011, that the majority of Scottish residents believe wild land is a value asset and ought to be protected. This lends the weight of “being in the national interest” to the SNH mapping work.
- There has been some discussion as to whether the boundaries presented in the Phase III CAWL maps should be regarded as discrete or fuzzy (i.e. vague). Certainly the concept of wildness is fuzzy and it is difficult to see how the transition from non-wild to core wild land areas can ever be mapped with 100% certainty, but for planning and decision making purposes a discrete and definitive line on the map is required. Protection of wildness and core wild land areas in Scotland needs, despite the uncertainties associated with mapping a vague and fuzzy concept, a definitive line on the map.

Appendix 2 - Tables

Table 3.1 Hill summits visible from proposed Talladh-a-Bheithe wind farm

Hill name	Class	Height (m)	OS Grid Ref	Nearest Turbine	Distance (m)	View angle	Turbines visible
Ben Lawers	Munro	1214	NN635414	23	22874	112	24
Ben Alder	Munro	1148	NN496718	4	8052	-63	12
An Stuc	Munro	1118	NN638430	23	21466	114	24
Meall Garbh	Munro	1118	NN644437	23	21099	116	24
Aonach Beag	Munro	1116	NN457741	4	12104	-52	18
Stob Coire Easain	Munro	1115	NN308730	0	23172	-26	2
Meall a'Bhuiridh	Munro	1108	NN250503	0	29300	25	3
Beinn Ghlas	Munro	1103	NN625404	20	23398	112	24
Ben Alder - Sron Bealach Beithe	Munro	1103	NN499707	4	6900	-61	24
Schiehallion	Munro	1083	NN713547	23	18127	154	24
Beinn a'Chreachain	Munro	1081	NN373440	5	23385	51	24
Beinn Heasgarnich [Beinn Sheasgarnaich]	Munro	1078	NN413383	5	26252	66	24
Meall Corranaich	Munro	1069	NN615410	20	22506	111	17
Ben Lawers - Creag an Fhithich	Munro	1047	NN635422	23	22109	113	24
Creag Mhor	Munro	1047	NN391361	5	29213	64	6
Chno Dearg	Munro	1046	NN377741	2	17860	-36	13
Meall nan Tarmachan	Munro	1044	NN585390	20	23611	102	24
Carn Maig	Munro	1041	NN684512	23	17575	139	24
Meall Ghaordaidh	Munro	1039	NN514397	20	22494	84	24
Carn Gorm	Munro	1029	NN635500	23	15212	124	16
Beinn Bheoil	Munro	1019	NN517717	4	7207	-77	24
Carn Maig - Meall Liath	Munro	1012	NN693512	23	18266	141	24
Beinn Udlamain	Munro	1011	NN579739	9	10321	-114	11
Carn Maig - Meall a'Bharr	Munro	1004	NN668515	23	16188	136	24
Beinn Achaladair South Top	Munro	1002	NN342420	5	26964	49	18
Sgairneach Mhor	Munro	991	NN598731	9	10535	-125	5
Chno Dearg - Meall Garbh	Munro	976	NN371727	0	17523	-35	8
Chno Dearg - Meall Garbh (old GR)	Munro	975	NN371730	0	17759	-35	11
A'Mharconaich - Bruach nan Iomairean	Munro	972	NN601758	9	13009	-119	5
Meall Garbh	Munro	968	NN647517	23	14589	131	24
Sgairneach Mhor (old GR)	Munro	963	NN594727	9	10011	-125	8
Beinn Bheoil - Sron Coire na h-Iolaire	Munro	956	NN513704	4	6091	-71	24
Sgor Gaibhre	Munro	955	NN444674	0	8512	-33	24
Meall Corranaich - Sron dha-Murchdi	Munro	935	NN611404	20	22953	109	24
Meall Buidhe	Munro	932	NN498499	5	12594	80	24

Sgor Gaibhre - Sgor Choinnich	Munro	929	NN443683	0	9113	-37	24
Meall a'Choire Leith	Munro	926	NN612439	20	19717	113	24
Beinn Eibhinn - Meall Glas Choire	Munro	924	NN436727	2	12488	-47	20
Carn Gorm - An Sgorr	Munro	924	NN640509	23	14767	127	11
Beinn Mhanach - Beinn a'Chuirn	Munro	923	NN360409	5	26732	53	11
Meall Buidhe SE Top	Munro	917	NN500489	5	13555	82	24
Meall nan Tarmachan - Creag na Caillich	Munro	916	NN562377	20	24542	96	21
The Fara	Corbett	911	NN598842	9	20636	-107	3
Beinn nan Oighreag	Corbett	909	NN541412	20	20902	92	5
The Fara South Top	Corbett	904	NN595829	9	19236	-107	7
Sgor Gaibhre - Beinn a'Chumhainn	Corbett	902	NN462710	3	9424	-45	24
The Fara - Leacann na Sguabaich	Corbett	901	NN586819	4	18012	-107	7
The Fara - Meall Cruaidh	Corbett	897	NN578808	4	16731	-106	8
Beinn a'Chuallaich	Corbett	892	NN684617	22	13386	174	24
Carn Mairg - Meall nan Eun	Corbett	874	NN707509	23	19555	143	2
Meall na Meoig of Beinn Pharlagain	Corbett	868	NN448641	0	6902	-12	23
Sgor Gaibhre - Meall a'Bhealaich	Corbett	865	NN452695	2	9095	-39	4
Beinn Udlamain - An Sgulan	Corbett	865	NN570722	9	8344	-113	14
Cam Chreag	Corbett	862	NN536491	20	12968	90	24
Carn Dearg - Meall nam Fiadh	Corbett	861	NN420652	0	9840	-15	10
Beinn a'Chruaiste	Corbett	857	NN246566	0	27648	13	14
Beinn a'Chuallaich - Meall nan Eun	Corbett	852	NN685625	22	13369	177	24
Sgor Gaibhre - Sron na Saobhaidhe	Corbett	852	NN457692	2	8515	-40	16
Meall Ghaordaidh - Meall na Cnap-laraich	Corbett	846	NN498397	20	22649	81	4
Meall nan Tarmachan - Creag an Lochain	Corbett	842	NN590402	20	22550	104	17
Beinn Mholach	Corbett	841	NN587654	22	4261	-148	20
Sron a'Choire Chnapanich	Corbett	837	NN456453	5	18212	70	14
Beinn Dearg	Corbett	830	NN608497	23	14153	114	24
Meall Buidhe - Meall Cruinn	Corbett	830	NN458478	5	15814	67	24
Beinn Udlamain - Glas Meall a'Chumhainn	Corbett	827	NN572697	9	6242	-124	1
Meall Garbh - Meall Breac	Corbett	802	NN638542	23	12154	136	24
Meall nan Tarmachan point 796m	Corbett	796	NN558375	20	24692	95	1
Carn Mairg - Geal Charn	Corbett	792	NN681544	23	15397	148	24
Beinn Mholach - Beinn Bhoidheach	Corbett	790	NN567655	22	2765	-124	11
Meall Tairneachan	Corbett	787	NN807543	23	26965	162	15
Farragon Hill	Corbett	783	NN840553	23	29869	166	2
Meall nam Maigheach	Corbett	779	NN585436	20	19139	105	24
Cam Chreag - Meall Luaidhe	Corbett	778	NN581437	20	18936	104	15
Carn Mairg - Meallanan Odhar	Graham	756	NN679531	23	15995	143	2
Beinn Mholach - Meallanan Odhar	Graham	750	NN553670	9	2893	-121	16
Beinn a'Chuallaich - Carn Fiaclach	Graham	748	NN660621	22	10907	174	23
Meall a'Bhuiridh - Creag Dhubh	Graham	748	NN258520	0	27959	23	11
Meall a'Mhuic	Graham	745	NN579508	20	12097	111	10

Beinn Udlamain - Stob Loch Monaidh	Graham	743	NN558686	9	4538	-116	4
Beinn Dearg - Creag Ard	Graham	741	NN601488	23	14739	110	24
Cam Chreag - Meall nam Maigheach	Graham	741	NN556495	20	12752	99	24
Stob na Cruaiche	Graham	739	NN363571	0	16265	20	24
Meall Tairneachan - Ciochan a'Chop	Graham	731	NN808551	23	26805	164	23
Beinn a'Chrulaiste - Meall Bhalach	Graham	708	NN259576	0	26144	11	15
Beinn a'Chrulaiste - Meall Bhalach East Top	Graham	705	NN268571	0	25406	13	18
Meall Tairneachan - Meall Odhar Mor	Graham	678	NN792543	23	25526	161	23
Meall Buidhe - Carabad	Graham	657	NN485516	5	11306	72	1
Farragon Hill - Creag an Lochain	Graham	656	NN839567	23	29426	168	2
Meall Buidhe - Meall a'Bhobuir	Graham	655	NN518520	20	10254	80	10
Meall Tairneachan - Creag Chean	Graham	654	NN795532	23	26187	159	11
Cam Chreag - Meall nan Sac	Graham	653	NN561517	20	10690	104	7
Farragon Hill North Top	Graham	651	NN843562	23	29922	168	2
Cam Chreag - Meall nan Sac South Top	Graham	650	NN561510	20	11372	103	23
Beinn a'Chrulaiste - Meall nan Ruadhag	Graham	647	NN298576	0	22404	13	19
Stob an Aonaich Mhoir - Sron a'Chlaonaidh	Graham	628	NN514654	3	1835	-35	24
Beinn Mholach - Gualann Sheileach	Graham	612	NN617651	22	6817	-164	15
Creag a'Mhadaidh	Graham	612	NN634650	22	8516	-168	17
Meall Dubh	Other hill	607	NN654600	23	10654	165	23
Leagag	Other hill	601	NN518539	20	8358	78	24
Creagan na Corr	Other hill	600	NN611540	23	10554	125	24
Meall Garbh	Other hill	600	NN546639	19	503	-88	24
Meall Dubh West Top	Other hill	599	NN650603	23	10193	167	23
Garr Leacann	Other hill	558	NN345582	0	17700	15	23
Meall Ban	Other hill	547	NN545621	23	821	44	21
Carn a'Chullaich	Other hill	530	NN791729	22	25836	-158	2
Sgurr Dearg	Other hill	525	NN595637	22	4378	-174	21
Sron Bheag	Other hill	516	NN524626	10	182	-34	11
Meall an Uillt Riabhaich	Other hill	507	NN491615	0	2806	27	2
Creagan Geur	Other hill	503	NN710565	23	17069	159	23
Glas Bheinn	Other hill	501	NN326473	0	24431	39	14
Tom an Stoil	Other hill	493	NN525599	20	2455	63	23
Meall Mor	Other hill	492	NN303471	0	26422	36	11
Meall Chomraidh	Other hill	466	NN483556	5	7587	62	24
Sron nan Calamag [Coille Mhor]	Other hill	367	NN531563	20	5816	85	10

Annex 3 - Figures

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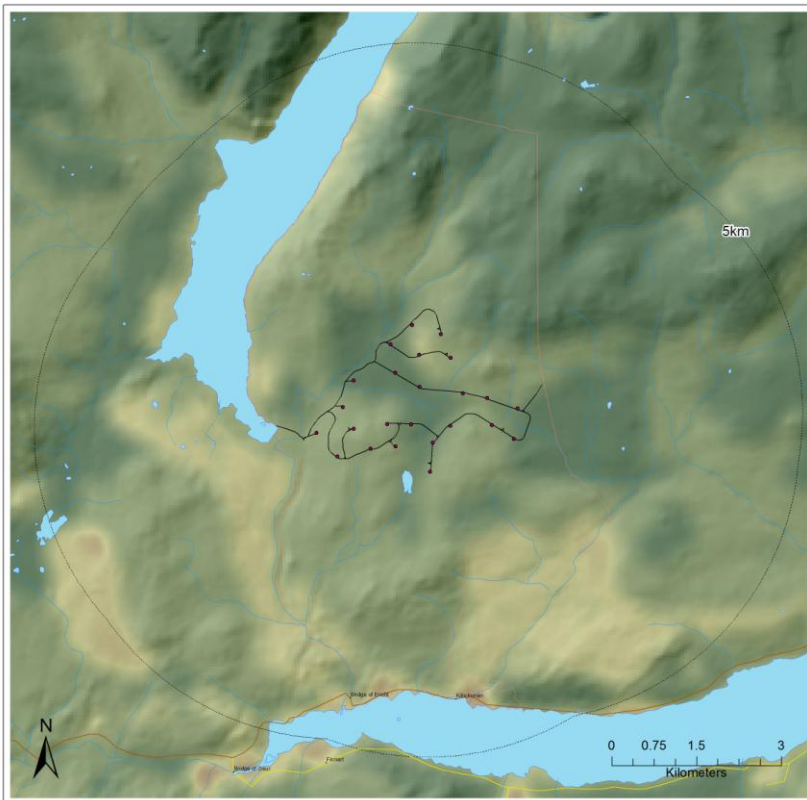


Figure 3.1
 Perceived naturalness
 of land cover (current)

Source: SNH (2014)

Legend

Perceived naturalness

- High
- Low
- Station
- Proposed turbines
- Proposed access roads
- A road
- B road
- Minor road
- Railway
- Talladh-a-Bheithe estate
- Lochs50k
- River

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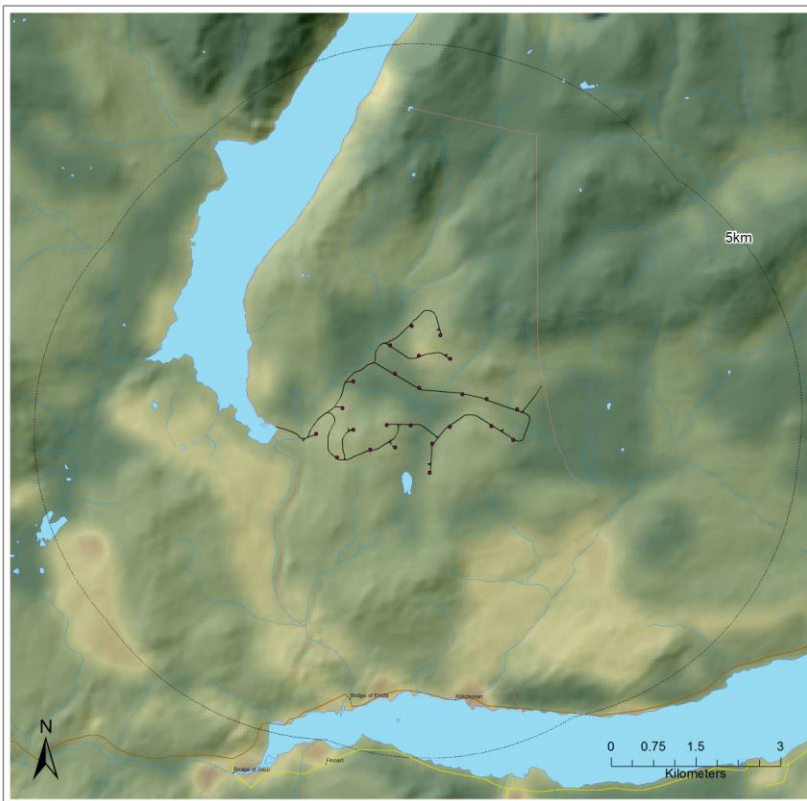


Figure 3.2
 Perceived naturalness
 of land cover (proposed
 development)

Legend

Perceived naturalness

- High
- Low
- Station
- Proposed turbines
- Proposed access roads
- A road
- B road
- Minor road
- Railway
- Talladh-a-Bheithe estate
- Lochs50k
- River

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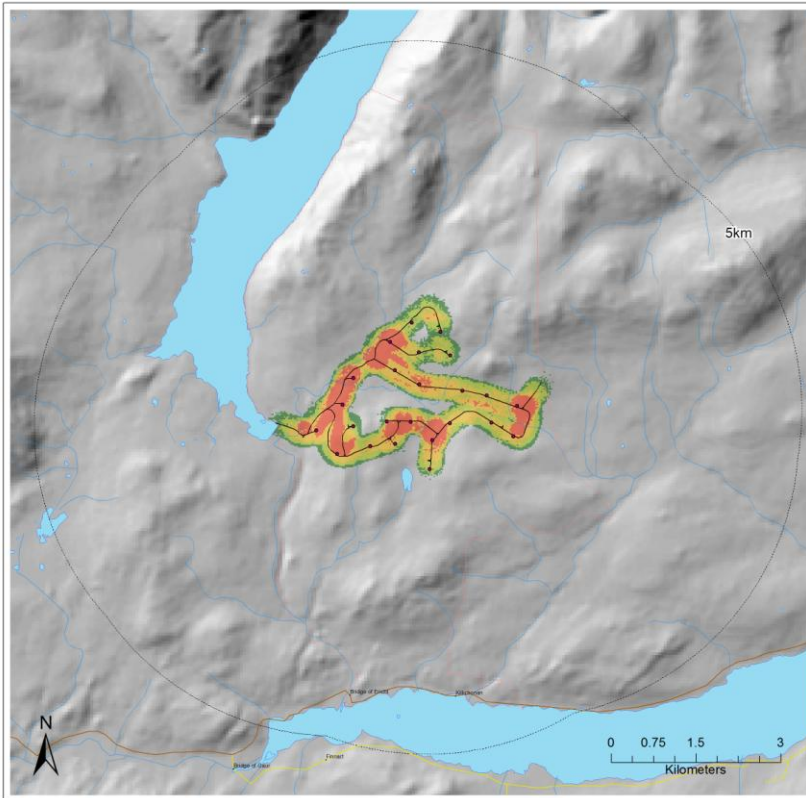


Figure 3.3
 Level of increased impact on perceived naturalness of land cover (with proposed development)

- Legend**
- Additional impact**
- <25%
 - 25<50%
 - 50<75%
 - 75<100%
- Station
 - Proposed turbines
 - Proposed access roads
 - A road
 - B road
 - Minor road
 - Railway
 - Talladh-a-Bheithe estate
 - Lochs50k
 - River

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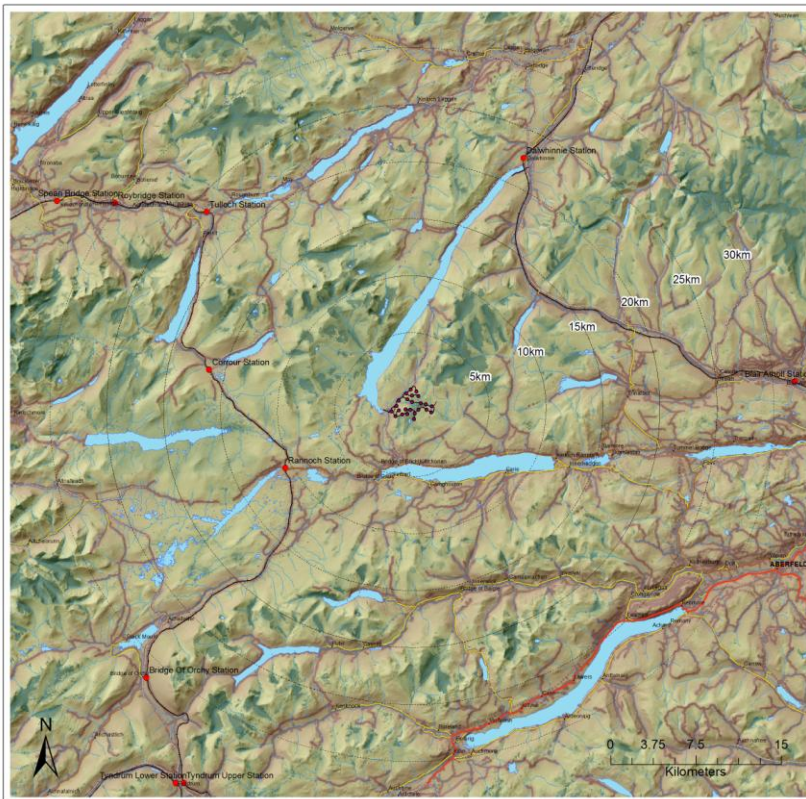


Figure 3.4
 Absence of modern human artefacts (current)
 Source: SNH (2014)

- Legend**
- Absence of modern artefacts**
- High
 - Low
- Station
 - Proposed turbines
 - Proposed access roads
 - A road
 - B road
 - Minor road
 - Track
 - Railway
 - Talladh-a-Bheithe estate
 - Lochs50k
 - River

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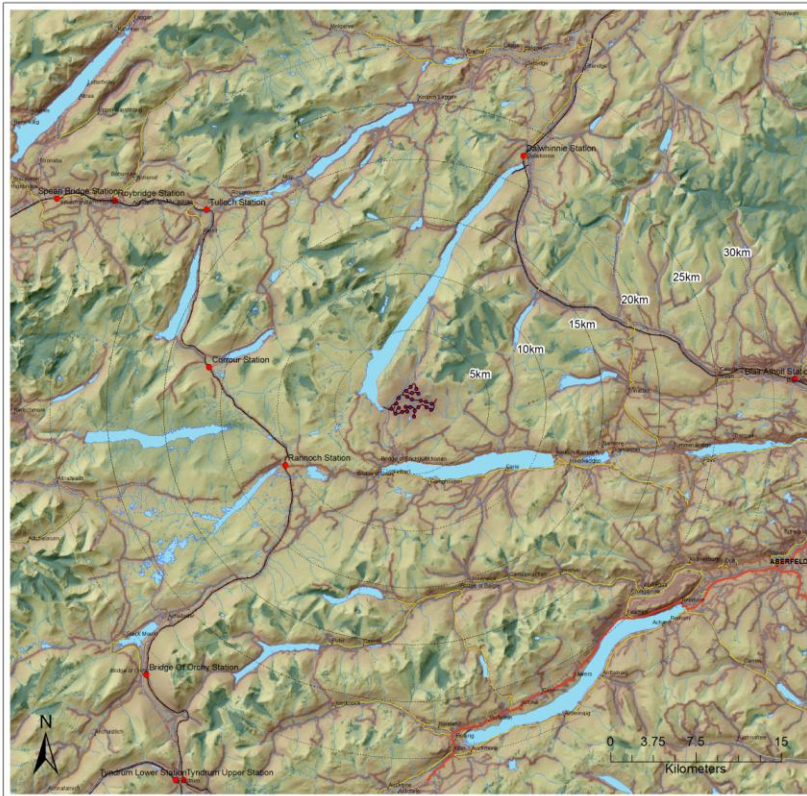


Figure 3.5
 Absence of modern human artefacts (with development)

Legend

Absence of modern artefacts



- Station
- Proposed turbines
- Proposed access roads
- A road
- B road
- Minor road
- Track
- Railway
- Talladh-a-Bheithe estate
- Lochs50k
- River

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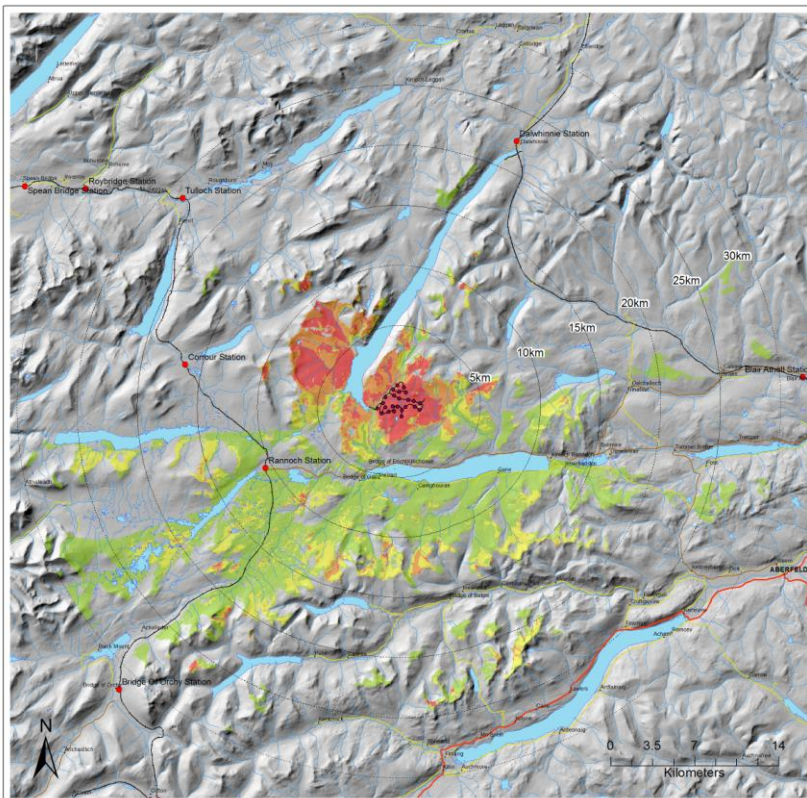


Figure 3.6
 Level of increased visual impact (with development)

Legend

Additional impact



- Station
- Proposed turbines
- Proposed access roads
- A road
- B road
- Minor road
- Track
- Railway
- Talladh-a-Bheithe estate
- Lochs50k
- River

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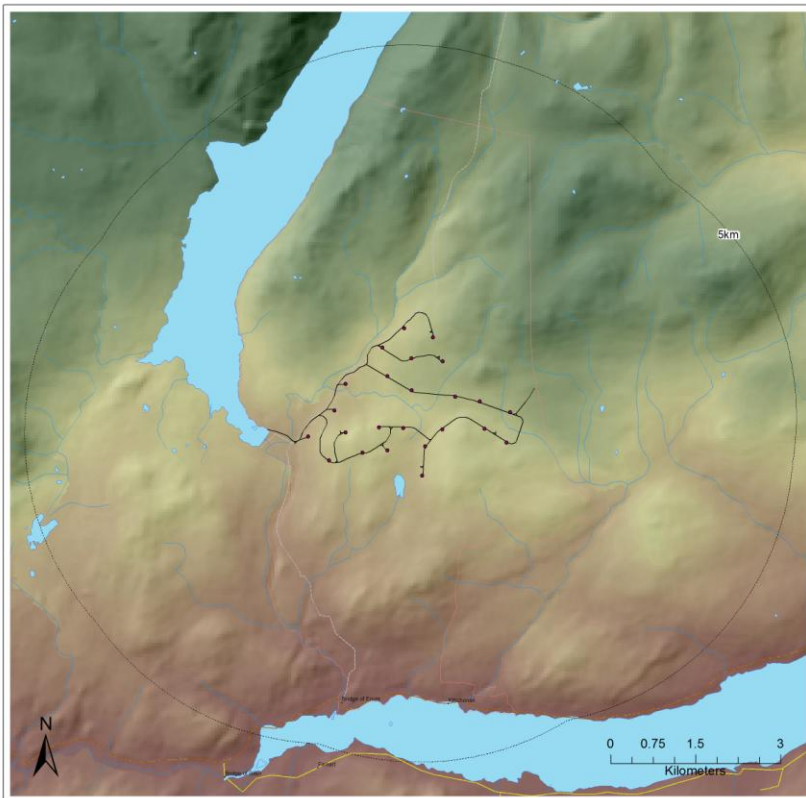


Figure 3.7
 Remoteness from
 mechanised access
 (current)

Source: SNH (2014)

Legend

- Remoteness**
- High
 - Low
- Station
 - Proposed turbines
 - Proposed access roads
 - A road
 - B road
 - Minor road
 - Track
 - Railway
 - Talladh-a-Bheithe estate
 - Lochs50k
 - River

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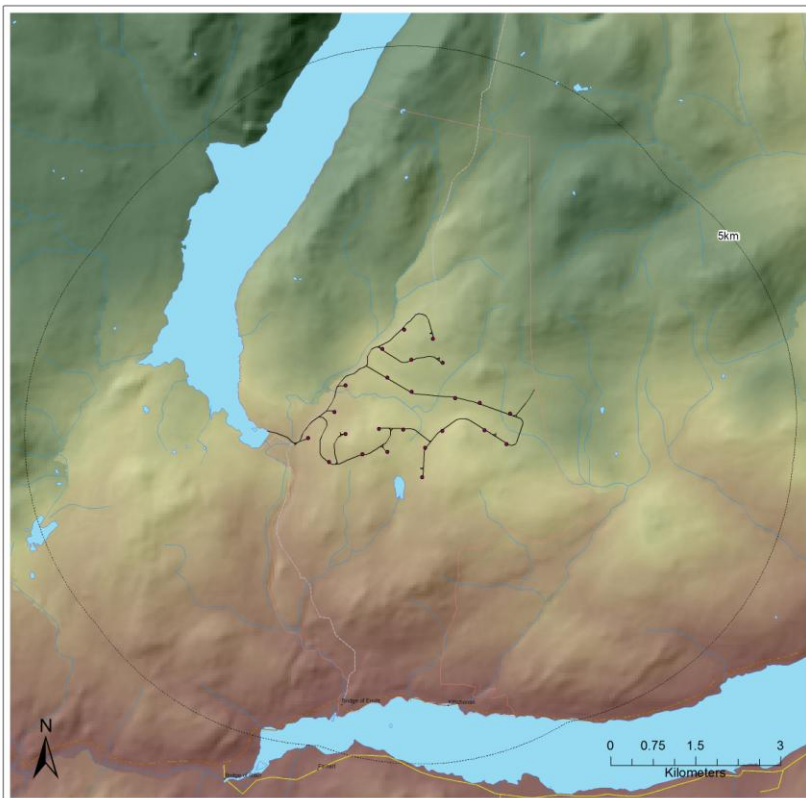


Figure 3.8
 Remoteness from
 mechanised access
 (proposed development)

Legend

- Remoteness**
- High
 - Low
- Station
 - Proposed turbines
 - Proposed access roads
 - A road
 - B road
 - Minor road
 - Track
 - Railway
 - Talladh-a-Bheithe estate
 - Lochs50k
 - River

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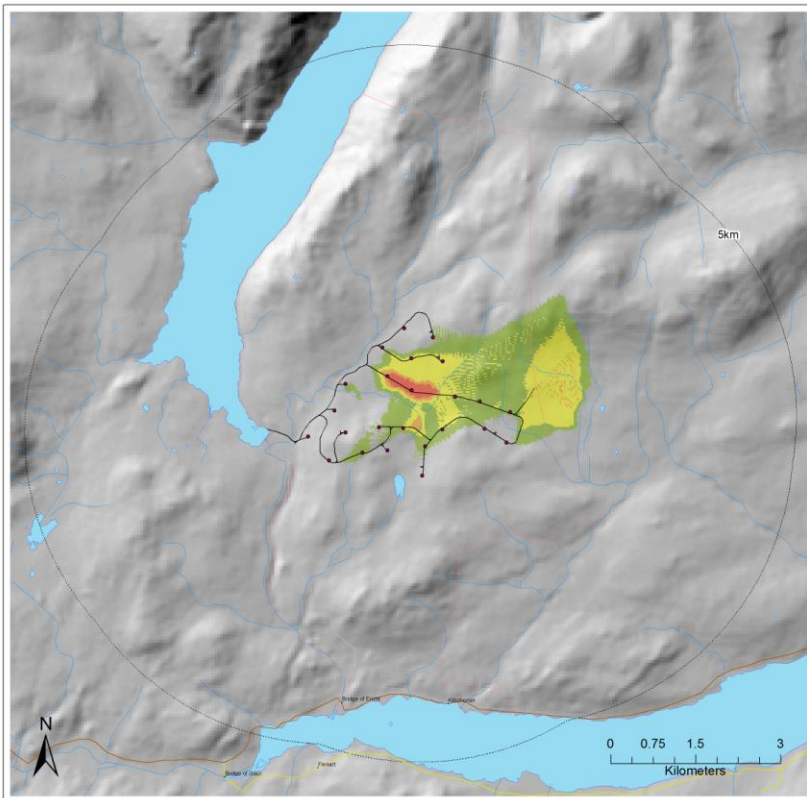


Figure 3.9
 Level of reduced remoteness (proposed development)

- Legend**
- Reduced remoteness
- zero
 - very low
 - low
 - moderate
 - high
- Station
 - Proposed turbines
 - Proposed access roads
 - A road
 - B road
 - Minor road
 - Track
 - Railway
 - Talladh-a-Bheithe estate
 - Lochs50k
 - River

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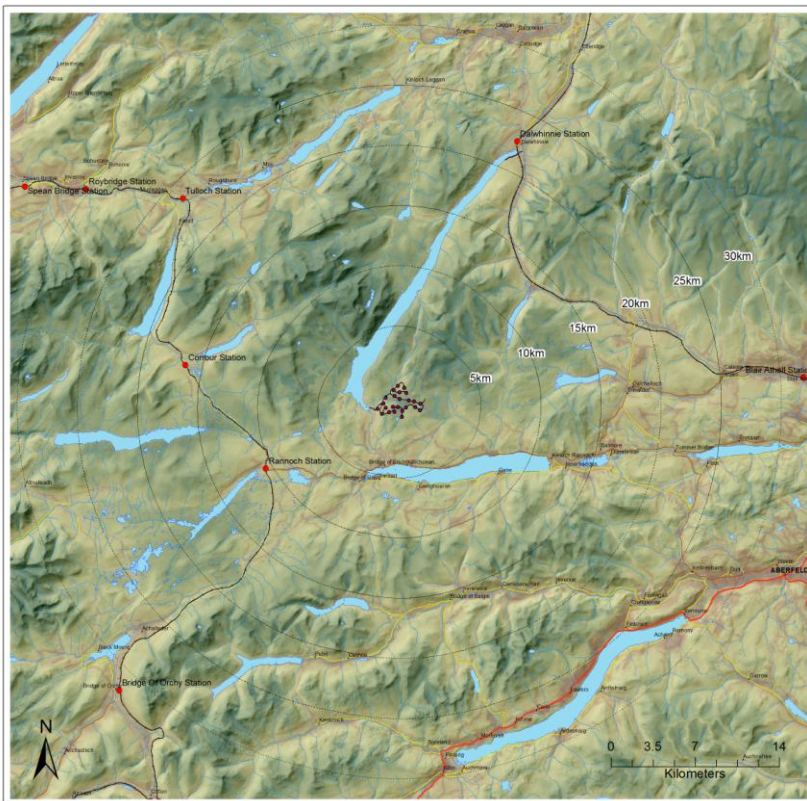


Figure 3.10
 Relative wildness (current)

Source: SNH (2014)

- Legend**
- Wildness
- High
 - Low
- Station
 - Proposed turbines
 - Proposed access roads
 - A road
 - B road
 - Minor road
 - Track
 - Railway
 - Talladh-a-Bheithe estate
 - Lochs50k
 - River

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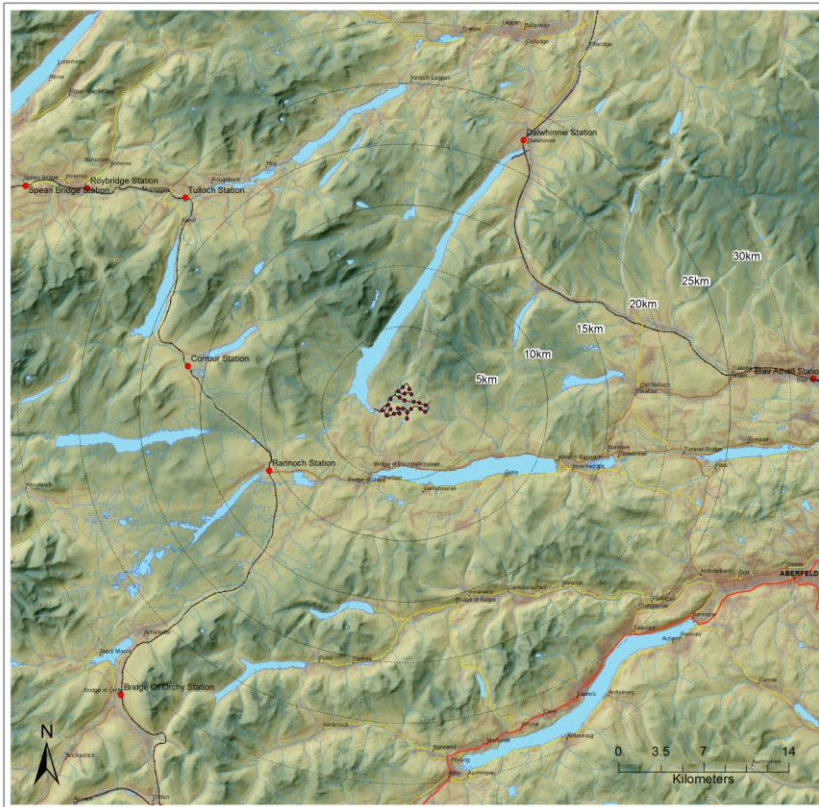


Figure 3.11
 Relative wildness
 (proposed development)

- Legend**
- Wildness**
- High
 - Low
- Station
 - Proposed turbines
 - Proposed access roads
 - A road
 - B road
 - Minor road
 - Track
 - Railway
 - Talladh-a-Bheithe estate
 - Lochs50k
 - River

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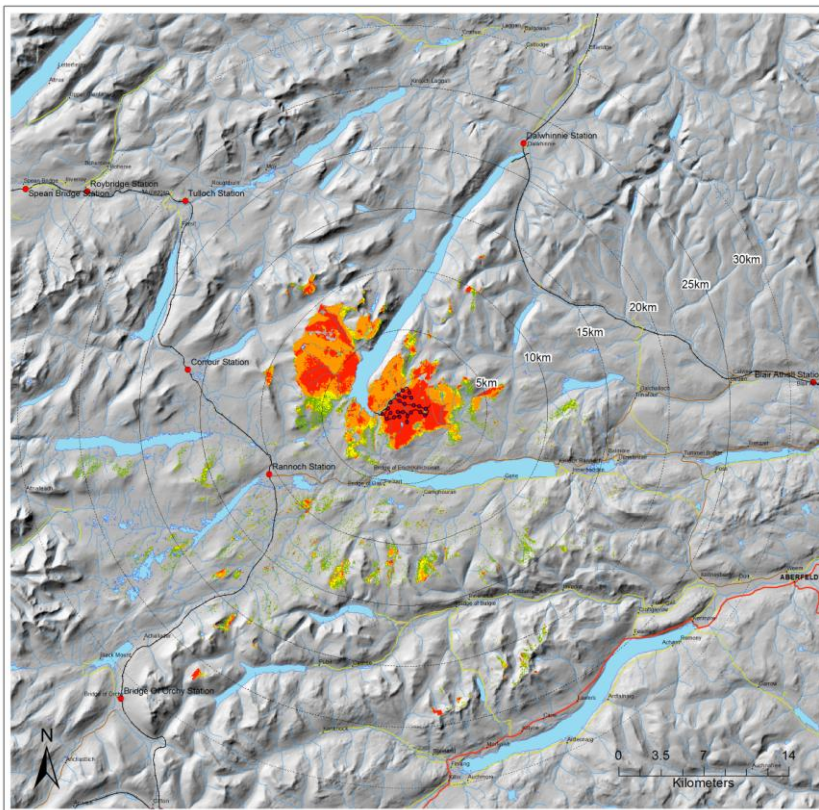


Figure 3.12
 Reduction in relative wildness
 (proposed development)

- Legend**
- Reduction in wildness**
- zero
 - low
 - moderate
 - high
 - very high
 - Station
 - Proposed turbines
 - Proposed access roads
 - A road
 - B road
 - Minor road
 - Track
 - Railway
 - Talladh-a-Bheithe estate
 - Lochs50k
 - River

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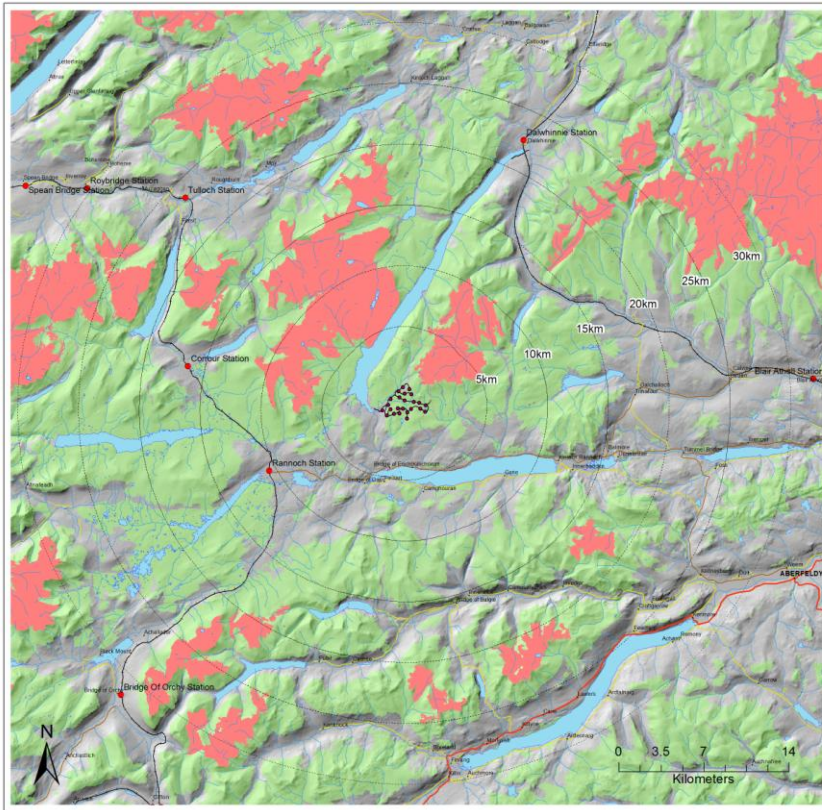


Figure 3.13
 Wild land zones 7&8
 and 5&6
 (current)

- Legend**
- Wild land zones**
- 7 and 8
 - 5 and 6
 - Station
 - Proposed turbines
 - Proposed access roads
 - River
 - A road
 - B road
 - Minor road
 - Railway
 - Track
 - Talladh-a-Bheithe estate
 - Lochs50k

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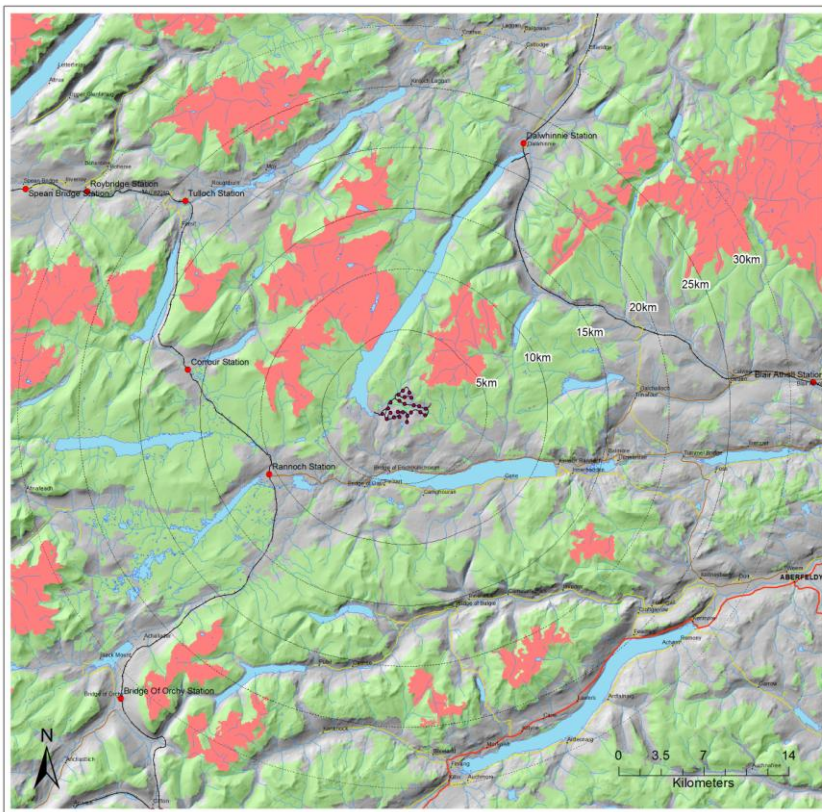


Figure 3.14
 Wild land zones 7&8
 and 5&6
 (proposed development)

- Legend**
- Wild land zones**
- 7 and 8
 - 5 and 6
 - Station
 - Proposed turbines
 - Proposed access roads
 - River
 - A road
 - B road
 - Minor road
 - Railway
 - Track
 - Talladh-a-Bheithe estate
 - Lochs50k

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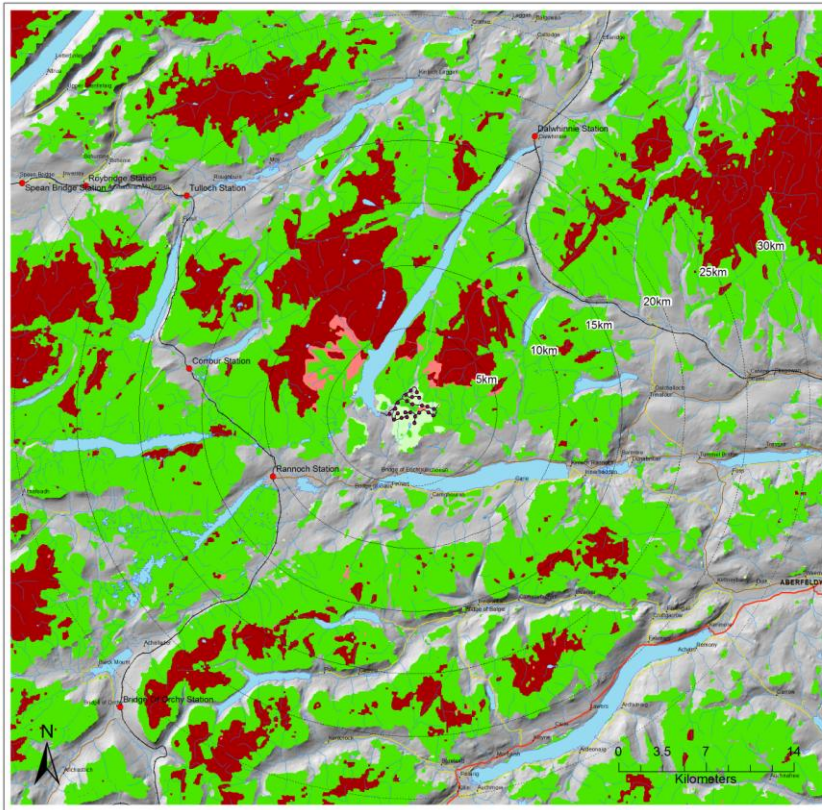


Figure 3.15
 Change in wild land zones 7&8 and 5&6 (proposed development)

- Legend**
- Predicted change**
- No change zone 7&8
 - Change 7&8 to 5&6
 - No change 5&6
 - Change 5&6 to 3&4
- Station
 - Proposed turbines
 - Proposed access roads
 - River
 - A road
 - B road
 - Minor road
 - Railway
 - Track
 - Talladh-a-Bheithe estate
 - Lochs50k

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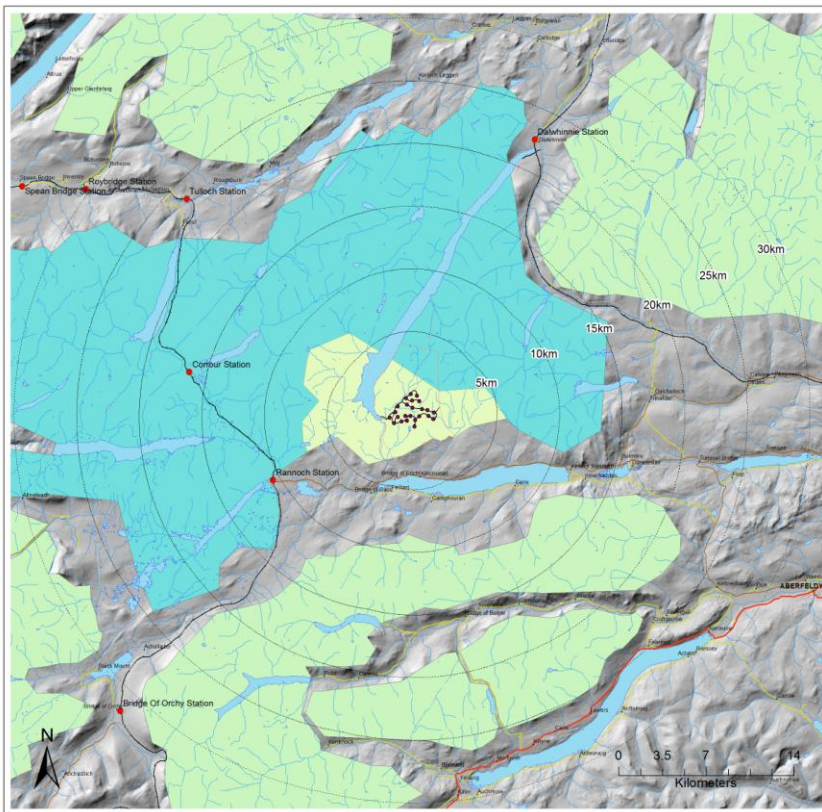


Figure 3.16
 Change in wild land area number 14 (proposed development)

Source: SNH (2014)

- Legend**
- Reduced wildland area 14
 - Wild land area removed
 - 2014 wild land areas
- Station
 - Proposed turbines
 - Proposed access roads
 - River
 - A road
 - B road
 - Minor road
 - Railway
 - Track
 - Talladh-a-Bheithe estate
 - Lochs50k

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