ANNEX 1 – SNH Core Areas of Wild Land 2013 Map Response Form

Q.1. What is your view on the Core Areas of Wild Land 2013 map?
Please refer to paper attached

Q.2. Do you have specific comments on any of the areas of wild land identified?
Please refer to paper attached

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?
Please refer to paper attached

Respondent Information Form

Please complete the two forms below and return with your consultation response. Your contact details are held solely for the purpose of the consultation.

Name or Organisation	Jones Lang LaSalle on behalf of Eventus BV and Talladh a Bheithe Estate
Title	[redacted]
Forename	
Surname	
Address	
Postcode	
Email	

Release of information contained in consultation responses

SNH will normally publish all consultation responses we receive, although personal data or other sensitive information will be redacted.

I am responding as an individual. **~~Yes~~ / No**	I am responding on behalf of a group or organisation. **Yes / ~~No~~**
Do you agree to your name being made available when we publish your consultation response? **Yes / ~~No~~**	The name of your organisation will be published along with your consultation response.

Q1 – What is your view on the Core Areas of Wild Land Map?

1.1 The identification of a series of core wild land areas, such as those which are set out on the Core Areas of Wild Land Map, is sound in principle as an approach for determining the extent of wild land within Scotland. However, we have a number of concerns regarding the specific methodology taken in the development of the current Core Areas of Wild Land Map, not least the lack of field testing to establish the validity of the proposed Core Areas on the ground.

1.2 SNH make clear that the methodology used in the process which led to the current Core Areas of Wild Land Map uses a blend of objective and subjective criterion, and that the thresholds between their 8 classes of quality are 'robust', in that the data used to derive them is statistically 'clumped' and graduation of data sets between classes is well defined. Review of the methodology, however, has determined multiple contradictions in criteria, and discrepancies which are held up by comparing classes of wildness to situations on the ground. An immediate issue with the methodology is that of the key wild land attributes, where the first, perception of wildness, is in fact perceptual rather than physical. This point may be of narrow focus but the initial impression is that the assessment baseline was somewhat ill-defined from the outset, which undermines confidence in the consistency and reliability of the process.

1.3 Indeed, the term "core area of wild land" creates another misleading impression from the outset, as it implies the entire area mapped and labelled as such is 'core'. Only following extensive analysis does it become clear that this is not the case, and that SNH appear to have extended the potential core areas of wild land beyond *real* 'core' areas to include a hinterland of lower quality. The current 2013 CAWL may have been extended to include a hinterland of lower value beyond earlier 'areas of search' identified in 2002 and those resulting from a first phase of GIS mapping in 2012. By comparison of the 2012 with the 2013 maps (resulting from Phase II and III methodology), the total number and size of CAWL has increased. Taking into consideration that many of the Phase I methodology criteria were revised to apparently make the selection process more rigorous and defensible (i.e., raising the class of land that can qualify as wild land), this increase is not as expected. It is understood that SNH intend the boundary to be 'fuzzy' to

'reflect the nature of wild land' and there are clear reasons why some boundaries have been rolled back or extended. However, despite extensive explanations published on the SNH wild land web site, the threshold of 'what wild land is' remains debatable when the CAWL boundaries are checked in the field. We have found a large number of inconsistencies and 'limitations' in the criteria and their application.

1.4 The main doubts about the justification of current boundaries are as follows:

- *The methodology appears to be based on adaptation of models used to assist in landscape designation elsewhere (e.g.., the Cairngorms National Park)*[1]

- *However, the consequences of adaption do not appear to have been understood for this exercise: no weighting of the layers of data was undertaken, for example, in the wild land GIS study while this was a key aspect of the original Cairngorms model on which it was based.*

- *The Phase I methodology description is not readily understandable as presented. There are several apparent inconsistencies and contradictions that need full explanation. A key example is that a different distance and GIS cell size are used to assess the impact of existing wind turbines to those used to assess other artefacts. This effectively introduces weighting mechanisms, although the Phase I 2013 method statement*[2] *expressly states no weighting of attributes has been applied.*

- *Phase II methodology applied a series of incremental steps or 'rules' to define the wild land threshold*[3]*. Although these clarify how the current CAWLs have been set, the rationale appears to contain arbitrary and subjectively defined goals or targets. For example, in first step states that a CAWL should contain a minimum quantity of 1000ha. of class 7/8 land. How that figure was arrived at is not stated. It is explained why this quantity is reduced to 500ha. for land south of the Highland Boundary fault, but not why these should be exactly 50% smaller than for those areas north of it. As a second step, the methodology explains why class 5 and 6 land could be added to the best quality areas, but*

[1] Reverence to *www.geog.leeds.ac.uk/groups/wildland/**Cairngorm**2008.pdf*
[2] See SNH Revised Phase I Methodology – February 2013, page 4 Para 7
[3] See SNH Phase II/III Methodology – March 2013, Page 2, Para 10

there is no limitation on the quantity stated which seems inconsistent.

- *The Phase III decision process is relied on a further subjective judgement. Boundaries defined by GIS mapping were smoothed out and drawn at a large scale (1:50,000)[4]. As the GIS criteria are also largely based on subjective opinions compounds these corroboration issues.*

1.5 While criteria for what is wild land have been derived by surveys of perceptions of wildness by representatives of the public, there is little evidence that the GIS based wilderness mapping has been followed up by systematic verification in the field. 'Judgement has been applied' is the closest description of the system of decision making that was used in Phase III. No details of a field assessment process, if any, have been made available. Without minutes of meetings or memorandum providing further information on the details of the decision making process, it appears from the published Description of Methodology these crucial steps in the potential CAWL selection process were based on uncorroborated subjective opinion of individuals rather than an auditable and consistent publicly accessible peer-review process. A speculative conclusion may be drawn that issues such as these would help to explain why areas that are not representative of wild land have been included in the designated CAWL.

1.6 The purpose of mapping potential core areas of wild land is sound in principle: it provides a means by which the location of areas with wild land attributes can be determined. However, we have demonstrated the SNH methodology is significantly flawed due to a number of contradictions and inconsistencies in Phase I methodology that appears to result in double counting in the scoring of attribute values, over-emphasising wildness in some areas. In addition, within the cumulative Map 5, '*Relative Wildness'*, the attributes are weighted evenly. As demonstrated by reassessing the zones of visibility, once these flaws are adjusted to account for all significant human artefacts, (not just SNH 'proxies') only once, there is much to argue that the land that is wild is much reduced according to SNH's own definitions, and thus the approach make little sense.

1.7 Additionally, albeit based on GIS mapping, the Phase II and III decision steps of the methodology are based in 'informed opinion'. Without an indication of

[4] See SNH Phase II/III Methodology – March 2013, Page 3, Para 12

what core areas are relatively wild to what, any decision based on the current analysis must be, by default, based solely on the personal preferences of the decision maker, and not on a commonly understood and agreed idea of wildness. Hence, there is significant doubt whether a '*robust and transparent approach*' has in fact been used to produce the current maps. It is evident that the result has been to incorporate the aprons or buffers of lower value areas to protect the highest classes of wildness. The methodology used to define potential CAWL boundaries lack a level of auditable clarity that should be anticipated for an exercise of such profound public significance.

1.8 We believe to have demonstrated the extent to which the current mapping model can be affected by reinterpretation of the parameters and criteria used to derive the wild land attributes. Our mapping illustrates that there appears to be considerably less true CAWL within our study area than SNH have indicated. This does not imply that we believe the SNH wild land policy does not work, but simply that the methodology is not transparent and that it contains errors, which if corrected would make the definition of wild land boundaries more comprehensible and, in our opinion, robust. This is a far more preferable situation even if CAWL are of a more modest geographic coverage.

1.9 In the light of the extent and depth of valid criticism there are reasonable grounds to doubt that the outcome of the CAWL process provides a transparent and usable tool to guide assessment of development in or near to wild in Scotland. This is particularly pertinent as it appears the consequence of the CAWL methodology has been to go beyond the intent of the 2002 SNH Wild Land Policy Statement, of the 2010 SPP, draft SPP 2013 and current NPF 3 Draft Framework (April 2013).

Q2 – Do you have any specific comments on any of the areas of wild land identified?

2.1 We have identified a test case study area where a number of the issues we have in relation to the methodology used to establish the Core areas of Wild Land Map can be illustrated. This study area falls within Area Number 14 'Rannoch-Nevis-Mamores-Alder' and covers the Talladh–a–Bheithe Estate, which lies to the north of Loch Rannoch in Perth and Kinross.

2.2 Wildness attributes and issues have been illustrated within this section via compilation of a series of maps: Figures A-01 to A-04 compare the various stages of wild land search area mapping in relation to the Talladh-a-Bheithe Study Area; Figures A-05 – A-12 show the Study Area re-evaluated using amended criteria; and Figures A-13, A-014 and A-15 show SNH Phase I map rasterised data transposed to the Talladh-a-Bheithe Study Area. We have also compiled a series of photo-views and aerial photographs (Figures B-01 to B-16) to illustrate key features and issues across the Study Area. Figure B-01, *Images Location Plan*, indicates the area of each feature or issue.

Study Area Description

2.3 Exhibiting a number of typical characteristics that would demonstrate the effects of issues, the Talladh–a–Bheithe Estate Study Area at Atholl in Perth and Kinross has been selected as a typical land parcel on the border of a potential core area of wild land (see Figure A-01, *Study Area Regional Context*). It is located approximately equidistant between Fort William and Pitlochry on the southern boundary of wild land core area no. 14, and approximately 3km north of Loch Rannoch.

2.4 The Talladh-a-Bheithe Estate Study Area falls mostly within the boundary of the 2013 potential core area of wild land no. 14 (Rannoch-Nevis-Mamores-Alder). The current CAWL boundary has expanded significantly from the original SAWL, as can be seen by comparison of 2013 CAWL to original the SAWL (Figure A-02, *Study Area Context to 2003 Search Areas of Wild Land and 2013 Core Areas of Wild Land*). Large parts of the site are outwith (and do not lie between) areas of wild land that are Class 6 or above (Figure A-03 Study Area Context to Classes 6-8 Core Areas of Wild Land). As this seems to be at odds with the SNH Phase II and III CAWL mapping methodology, this provides an unambiguous reason to investigate why the CAWL has been

drawn 2-3km to the south of its original SAWL extent in this location.

Study Area Field Assessment

2.5 As illustrated by Figures B-02 to B-16, there are a number of features that lie within or near the current CAWL boundary that are not compatible with CAWL attributes. Of particular interest are those captured on Figures A-05 *Man Made Artefacts*; Figure A-06 ZTV of Buildings; Figure A-07 ZTV of Telecommunications Masts; Figure A-08 *ZTV of Plantation Woodland and Felled Woodland*; Figure A-09 ZTV of Public Roads and Railway; Figure A-10 *ZTV of Artificial Lochs*; and A-11 ZTV of Electricity Transmission Network. All of these maps appear to demonstrate that there are impacts within CAWL no. 14 and Talladh-a-Bheithe estate that should have ruled out large areas of it from being selected for inclusion as CAWL. Additionally, Figure A-12 *Terrain Analysis* indicates the land within the Talladh-a-Bheithe estate ranges between less than 5° and 20°, with some >30° slopes confined to the west, bordering the shores of Loch Ericht, indicating it lacks ruggedness and may not be, relative to say the Cairngorm monroes, challenging to access.

2.6 Figure B-02 *Rannoch Station and Railway* shows extensive infrastructure and development the southern part of study area, bordering and visible from CAWL no. 14. Figure B-03, shows power lines and metalled road, visible within the viewshed of the southern part of the study area.

2.7 A number of reservoirs and associated hydroelectric power generation infrastructure, such as Loch Ericht and Loch Eigheach (Figure B-04) and Gaur Power Station (Figure B-05), can be seen both from within the Talladh-a-Bheithe Estate itself and from within the CAWL, and is intervisible with views of it. Large scale hydroelectric works on Loch Rannoch include a power station and pipework ascending the hills to the north (Figure B-06). Similarly, large scale hydrological infrastructure can be seen in aerial views of Dalwinnie (Figure B-07) to the north end of Loch Ericht, as can power lines, roads, buildings and earthworks. Although some these structures are out with the CAWL boundary, they are intervisible with it as they are with the Talladh-a-Bheithe Study Area and as illustrated by Figures A-09 *ZTV of Buildings*, A-10 *ZTV of Electrical Transmission Network*, A-11 *ZTV of Telecommunication Masts* and A-12 *ZTV of Public Roads and Railways*.

2.8 Views from the south east and south west looking into the site from Rannoch Station and Kinloch Rannoch indicate that hydroelectric and power

transmission network infrastructure are widely intervisible with the Talladh-a-Bheithe Estate study area, (see Figures B-08 and B-09). The latter clearly identifies a dam, indicating Loch Rannoch, while likely to be natural in origin, is subject to water level management and draw-down. The settlement of Kinloch Rannoch itself is intervisible with a large area of CAWL as can again be seen in Figure A-09, *ZTV of Buildings*, as is Loch Rannoch (Figure A-05, *ZTV of Artificial Lochs*).

2.9 Additional features that are not compatible with wild land can be seen in the A9 corridor to the north east of the Talladh-a-Bheithe Study Area, as Figures B-10 *A9 Road at Dalnaspindal* and B11 *Loch Garry Hydro-electric Infrastructure* show. The A9 road itself is outside of CAWL but quite apparently visible from within it, as illustrated by Figures A-05 and A-10.

2.10 The Talladh-a-Bheithe Estate itself comprises rough grassland, moorland managed for shooting and a block of coniferous plantation in the central area (Figure B-12 *Plantation at Old Shielings Ford*). There are substantial economic forestry plantations bordering the Talladh-a-Bheithe Estate to the south (Leathad nan Craobh Fearna) and to the west (Creag an Fhithich). It is also bordered by a 14km long hydro-electric reservoir, Loch Ericht, which is dammed to both the north and the south. The southern dam is prominent to views from with the Talladh-a-Bheithe estate and falls with the CAWL (Figure B-16 *South Dam, Loch Ericht* and Figure A-10 *ZTV of Theoretical Visibility of Artificial Lochs*) and the water-managed Loch Rannoch to the south. The land within the estate has a varied, rolling rather than 'rugged' topography (*Figures B-14*), with a number of hills surrounding a series of shallow glens containing burns feeding Lochs Ericht and Rannoch. The elevation of land within the estate is between 420m (at Rhuighe Ghias) and 750m (Carn Dearg). To the north east of the estate, the topography creates an area of landscape with limited horizons which despite lack of tree cover is intimate, almost insular and inward-facing with an absence of views of human artefacts.

Comparative Mapping Exercise

2.11 To assist this assessment, a request was made for SNH to provide (amongst other information) the 8 Jenks Natural Boundary Optimisation (JNBO) classes shown as separate polygon shape files usable in GIS analysis GeoTIFF file format on 1st July 2013. Requested in order to help clarify SNH's technical mapping methodology and to enable replication of their approach in the test case area, this information has to-date not been forthcoming and therefore

this potentially informative and revealing exercise has not been possible, an unsatisfactory situation, albeit one which is not within our control. That such information has not been made readily available is a self-evident criticism of the level of transparency of the SNH mapping process.

2.12 The evaluation of how much land was included in the each of the 8 JNBO CAWL classes individually (rather than collectively as illustrated by the SNH maps A-N, Appendix VII) would enable determination of the extent of land considered to be of lesser quality, but still within 2013 CAWL, potentially illustrating how extensive is the apron of low class land. It would provide a basis comparison with the 2103 CAWL boundaries relevant to our case study area. This would have also determined the coincidence of high quality land with SAWL land more precisely than can be done with the publically available information. The approximation in Figure A-03 does, however, illustrate unsurprisingly that the original 2002 SAWL does appear to contain chiefly high quality wild land. It also shows clearly that according to the 2013 methodology, large areas of contiguous CAWL lay beyond the original SAWL boundaries.

2.13 Figure A-04a *Comparison between 2012 SNH CAWL and 2013 SNH CAWL and* Figure A-04b (- *in Study Area)* demonstrate that the 2013 boundaries have indeed increased. Figure A-04a shows the comparison nationally and Figure A-04b provides a comparison within the Talladh-a-Bheithe Estate Study Area. The rasterised maps (jpg files) published by SNH online are poor quality but it never-the-less demonstrates the initial cause for concern as referred to in Para 1.5 of this report, i.e., that there is a significantly greater mass of land encompassed by the 2013 CAWL maps than the 2012 maps, despite the introduction of more rigorous revised Phase I methodology and mapping criteria.

2.14 Despite problems encountered in obtaining what should be publicly accessible technical information from SNH necessary for a full assessment, we have been able to produce an approximation (or in the SNH terminology, a 'proxy') of the mapping of potential areas of wild land related specifically to a study area by adapting the publically available mapping and GIS data provided by SNH on the SNHi website.

Proxy Mapping Study

2.15 The purpose of the proxy mapping study is twofold:

1) To approximate what results could be obtained by correcting some of the key anomalies and errors identified in the preceding section of this report to assess how the core areas of wild land criteria would affect the estate and its surroundings using the amended parameters.

2) To assess the site against the existing SNH Phase I 'Relative Wildness' map.

2.16 Following the analysis of faults with SNH scoring mechanism it would ideally be an objective to produce a new *Relative Wildness* map. This would be carried out by capturing *all* features that have man made attributes in the *Absence of Human Artefacts* layer. By preventing these features being captured as neutral/positive wild land indicators in other layers, or of being 'double counted', more realistic and accurate scores would be obtained.

2.17 The proxy mapping approach examines SNH wildness attributes individually in relation to the Talladh-a-Bheithe Estate and the surrounding area to a radius of 15 km (the Study Area) from where their effects would be perceived. The distance approximates the 15km ZTV which manmade artefacts are assessed in the SNH Map 4, *Absence of Manmade Artefacts* methodology. We have also followed SNH premise that physical attributes can be 'proxies' for perceptual responses, and that: ***"if one of the perceptual responses is not present, that location will not be true wild land"***[5]. Hence, if there are views of human artefacts from within a given area, it should not be rated as core wild land. We emphasise, however, that without further clarification from SNH we do not know if this assumption is correct. All the same, applying it provides a useful insight into the problems inherent in the SNH CAWL methodology.

2.18 In undertaking proxy test case mapping using our amended methodology, we have used SNHi Wild Land web site ArcGIS rasterised datasets as well as capturing site-specific field assessment. How amendments, in particular to the Zones of Theoretical Visibility (ZTV) of a number of wild land indicators, have been applied is explained within the following sections.

Map 1: Perceived Naturalness

2.19 The SNH Phase I 'Perceived Naturalness' uses national level LCM 2007 GIS

[5] Page 5, Para 2.1.3 SNH Interim Guidance Note: Assessing the Impacts on Wild Land (Feb 2007)

datasets to determine the landcover make up across Scotland. Using the land classes as a 'surrogate' for wildness attributes such as wild life and natural-looking vegetation and landscape, and "seeks to capture two attributes: 'a high degree of perceived naturalness in its setting, especially in its vegetation cover and wildlife, and in the natural processes affecting the land."

2.20 The LCM 2007 land use classes were given naturalness score applied through subjective judgement defined within Mapping Scotland's Wildness, Phase I, Annex I. A score of 1 implied 'low perceived naturalness' and a score of 5 implied 'high perceived naturalness.' We do not agree that 'Coniferous Woodland' is Class 3, *'some perception of naturalness'* or that felled woodland is Class 2 *'low perception of wildness'*; as they are artificial man-made features within the landscape, they do not *per se* reflect a perception of naturalness.

2.21 The SNH Phase I 'Perceived Naturalness' methodology notes that the "influence of cells within 250m of the target cell was considered" to take account of the visual influence of landcover within the surrounding landscape. Figure A-02, *ZTV of Plantation Woodland and Felled Woodland* (derived from the National Forest Inventory database) shows that the visual influence of commercial forestry extends beyond 250 metres of the Talladh-a-Bheithe estate and within the boundaries of the CAWL. Likewise, Figure A-02 *ZTV of Artificial Lochs*, Figure B-16, *Loch Ericht dam* and Figure B-11, *Dalwinnie dam and spillways* illustrate that the visual influence of reservoirs or impounded water extends into the estate and/or CAWL and hence question the validity of the CAWL boundaries and wild land characteristic of this attribute within Talladh-a-Bheithe.

2.22 The effect of isolating plantations and reservoirs and mapping them individually is to enable them to be removed from the Perceived Naturalness map so they can be scored as Human Artefacts. Ideally this would be reflected in the final composite Map 5, *Relative Wildness*, (Figure A-11) in line with the conclusions of our critical analysis above.

Map 2: Rugged and Challenging Terrain

2.23 Figure A-04 *Terrain analysis within the Talladh-a-Bheithe Estate* confirms the initial impression from field assessment that land within the estate is (relatively) not rugged or challenging. The photo-view in Figure B-14 shows relatively high but rounded hills directly within the Talladh-a-Bheithe estate,

and by comparison, snow-clad and sharply profiled peaks of the Cairngorms in the distance.

2.24 Figure A-14, SNH Phase I *'Rugged and Challenging Terrain'* mapping "seeks to capture ruggedness: 'landform which is otherwise physically challenging." The SNH method uses a 50 metre resolution dataset that is converted into a 256 interval scale. The conversion of this data does not accurately reflect gradients at the 'site level' of detail. Within the Talladh-a-Bheithe Estate case study the location of the CAWL boundary follows an area of 'low ruggedness' therefore is not an accurate reflection of 'landform which is otherwise physically challenging' even if this SNH principle was considered to be correct.

2.25 The SNH Phase I 'Remoteness from Roads' maps *"remoteness and/or inaccessibility…taken as the relative time to walk from the nearest public road or ferry landing (being the point of mechanised access), taking account of distance, relative slope, ground cover and barrier features such as open water ."*[6]

2.26 Within the Talladh-a-Bheithe Estate Study Area Figure A-09 ZTV of Roads and railways indicates the location of southern and eastern CAWL no. 14 boundaries are within 'low remoteness'. The Talladh-a-Bheithe Estate Study Area shows that the visual influence of roads including vehicular traffic at +2 metres height and people on tracks at +1.75 metres height would extend within the boundaries of the Core Areas. Figure B-14 shows a metalled track serving Corrievarkie Lodge and power station that penetrates the Talladh-a-Bheithe Estate from south to north. Additionally, Figure A-09 shows that the ZVI of the A9 the A9 ZVI penetrates far further into the CAWL no 14 than the boundary would indicate, particular adjacent to Loch Garry reservoir. We therefore do not agree with location of the CAWL boundaries and wild land character within the Talladh-a-Bheithe Estate study area.

Map 4: Proxy of Absence of Human Artefacts Map

2.27 Within the Talladh-a-Bheithe Estate Study Area we have mapped individual layers for artefacts as follows: Figure A-05 - *ZTV of Buildings*; Figure A-06 *ZTV of Electricity Transmission Network* and Figure A-07 - *ZTV of Telecommunications Masts*; *and* Figure A-08 *ZTV of Public Roads and Railways*. The SNH Phase I *'Absence of Modern Artefacts'* mapping *"seeks to*

[6] Page 2 of 6. SNH Phase I, Mapping Scotland's Wildness

capture 'the lack of any modern artefacts or structures' meaning the lack of obvious artificial forms of buildings or structures within the visible landscape, including roads, tracks, railways, pylons, buildings and other structures referred to here as detractors."

2.28 Figures B-02 to B-11show public road, transmission lines and railway infrastructure located within visual catchment of the south of CAWL no. 14 Figures B-12 to B-16 illustrate metalled road, dams, power lines, plantations and reservoirs visible from within the Talladh-a-Bheithe Estate itself.

2.29 We consider that the visual influence of commercial plantation forestry should be included as an artificial man-made artefact as they are highly visible within the highland landscape and remove the perception of wild land character. Within the Talladh-a-Bheithe Estate study area the location of the southern CAWL boundary is within a 'moderate area' of modern man-made artefacts. The Talladh-a-Bheithe Estate case study shows that the visual influence of buildings (Figure A-06), telecommunications masts (Figure A-07) and public roads and railways (Figure A-08) would extend into the CAWL as well as across many parts of the estate itself.

2.30 We have also undertaken a partial inventory of man-made features within the Talladh-a-Bheithe Estate Study Area (Figure A-15). This shows that within the study area and over much of the estate, there are a high number of man-made artefacts including roads, residential properties, telecommunications masts, borrow pit excavations, hydro dams and inlets, commercial forestry areas and drainage ditches.

2.31 Views of artefacts can be obtained from within the Talladh-a-Bheithe estate, adjacent to it or inter-visibly. Figures B-06 shows, for example, hydroelectric infrastructure on Loch Rannoch with the southern edge of Talladh-a-Bheithe estate as a 'back-cloth'; while it is true that the southern hills shield part of the interior area of the estate from view of the hydro scheme, it will be visible from the ridge line in this view and therefore intervisible with wild land beyond. We therefore do not agree with location of the CAWL boundaries and wild land character within the Talladh-a-Bheithe Estate Study Area.

2.32 We believe that the key map in the Phase I SNH CAWL assessment is Figure A-09, *Map 4 Absence of Human Artefacts*. With reference to Figure A-11 *SNH Phase I Relative Wildness with the Talladh-a-Bheithe Estate Study Area*, bearing in mind that no weighting has been used and that no other attribute

has been overlaid, the map illustrates clearly that a majority of the study area will be within view of human artefacts and would be JNBO Class 6 or below. There is land within the Talladh-a-Bheithe Estate and wider study area that undoubtedly has wild land characteristics, but they are isolated areas of JNBO Classes 7/8 of less than 300 or 400ha., which according to the SNH Phase II methodology is too small (under 1000ha) to be selected as CAWL (the site is north of the Highland fault).

2.33 This conclusion is the case whether the SNH mapping method or our amended criteria as per Figures A-06 to A12 are applied. As can be seen by looking at Figure A-15, 'SNH Phase I Relative Wildness', only middling quality wild land (pale green or yellow) can be seen over the majority of the Talladh-a-Bheithe estate, with higher quality darker green areas to the north east. Figures A-06 to A12 indicate that there are multiple layers of wild land detractors, which if processed in the same way as the SNH maps, would undoubtedly show the wild land qualities to be of lower class still. Without fully assessing the land masses involved, a visual comparison between Figure A-11 and Figure A-02 indicates that the CAWL as mapped with corrections corresponds more closely to the 2002 SAWL for this region. It is highly probably that, applying similar corrections to the SNH methodology comprehensively, similar results would be obtained over large areas of the Scottish Highlands and islands.

2.34 The test case demonstrates how the SNH CAWL mapping exercise may have been carried out erroneously in some respects. It also shows how it could be made more robust by ensuring potential core wild land assessment criteria are appropriate, accurate, and consistent and if applied with a more rigorous rationale.

2.35 It is our understanding that the analysis above clearly indicates that the part of the Talladh-a-Bheithe Estate Area should not have been included as a Core Area of Wild Land. Should human artefacts have been considered robustly and field survey work been undertaken to ground test the proposed areas on site, it is clear this area would have been excluded from the Core Area of Wild Land. It is likely that this same conclusion would also apply to many other areas on the periphery of the proposed Core Area of Wild Land should they be analysed on site.

Q3. Are there any other issues regarding the Core Areas of Wild Land 2013 map, or its preparation, that you would like to raise?

3.1 The Core Areas of Wild Land Map was prepared using what is acknowledged to be a complex methodology. We have a number of concerns about the robustness of the approach taken across the various stages of this process from Phase I through to Phase III. These concerns were raised previously during the Scottish Government's Consultations on the NPF3 MIR and draft SPP and it is noted that in response this Consultation Paper has sought to address some of these issues. It is not considered however, that these issues have been fully addressed and we therefore wish to set out a number of these concerns once again, as we believe they remain valid.

Critical Review of Phase I Approach

3.2 The following provides our assessment of the revised Phase I methodology. Usefully, in response to the Phase I SNH consultation exercise, Pegasus (on behalf of E.ON Climate and Renewables) provided an assessment that commented on the CAWL methodology and five maps[7]. Pegasus was one of 16 respondents. SNH followed this with an analysis of the Analysis of *All Responses Received*[8], which provides insight into both SNH's and stakeholders/public view of the success of the exercise. We have systematically reviewed whether or not the consultation comments were acknowledged and acted on by SNH in their revised Phase I and new Phase II and III methodology.

3.3 While thorough, SNH analysis of the responses fell into three categories: rebuttals of criticisms; agreement by SNH that further work on the methodology was required; and 'noted' or no comment. The rebuttals can to a degree be seen as a definitive answer and explain why no action was taken, valid or not. However, SNH has not acted on a number of the other criticisms which they acknowledged as valid and would take account of in the next phase.

3.4 Where SNH admitted the methodology was weak, it did not do so directly. For

[7] Pegasus Phase I Consultation Response – 20 February 2012

[8] SNH Analysis of Responses on Phase I Wilderness Mapping – 30 April 2012

example, the word ‘limitations’ was used repeatedly to describe faults; ‘surrogates’ or ‘proxys’ instead of rough approximations, and so on, thus understating the severity of some of the problems highlighted by respondents to the Phase I consultation exercise. While SNH amended the methodology apparently in response to some criticisms, in a number of the areas where they admitted ‘limitations’, no amendments were made.

3.5 The relevance of identifying the issues raised by the consultation in regard to Phase I is thus to understand how the weaknesses in the methodology could have led to overestimation of quantity of potential areas of wild land, resulting in a *de facto* ‘protective apron’ of lesser quality land around the core areas. The issues that were raised but not answered satisfactorily, either by the immediate response of in the later phases, can be categorised into the following key issues:

1) Is the Phase I ***methodology*** used by SNH appropriate?

2) Are the Phase I ***attributes*** appropriate indicators of wildness?

3) Does the Phase I methodology ***cover all aspects*** of defining wildness appropriately?

1) Is the Phase I method used by SNH appropriate?

3.6 A number of issues with regards to the methodology stand out. It is our contention that these fundamentally affect the outcome of the study, and although raised at consultation, they have not been corrected. These are:

- *perceptual or experiential and physical attributes are ill-defined;*
- *GIS desktop study findings not systematically confirmed by field work;*
- *the use of ‘proxies’ or ‘surrogates’ for various attributes that the methodology does not map directly remain ‘debateable’;*
- *the CAWL methodology has adapted and excluded key elements of the tried and tested model for the study, namely Wildness in the Cairngorms National Park 2008 by Leeds University;*
- *the significant effect of not weighting attributes; and*
- *the methodology explanations remain unclear;*

- *the logic and value of compilation of Map 5, Relative Wildness*

3.7 These issues, we believe, may have resulted in significant anomalies in 'scoring' of some attributes. Each of these bullet points is discussed in turn in below.

Perceptual/experiential and physical attributes are ill-defined

3.8 The SNH Phase I 'Perceived Naturalness' mapping "seeks to capture two attributes: 'a high degree of perceived naturalness in its setting, especially in its vegetation cover and wildlife, and in the natural processes affecting the land."[9] The 'perceived naturalness' mapping uses national level LCM 2007 GIS datasets to determine the landcover make up across Scotland.

3.9 The label 'perceived naturalness' used to capture a 'nonspecialists' view is weak and contradictory justification. 'Perceived' is, by definition, not a 'physical' attribute, and the mapping exercise was undertaken by 'specialists'; a 'non-specialist view' here is not consistent with the approach, particularly one as involved as the GIS modelling SNH are attempting to capture, never mind the Jenks Natural Break Optimisation statistical analysis tool yet to come. This is the first map, and it is perhaps portentous that such telling confusion and contradiction is evident from the outset.

3.10 The problem of the application of this 'nonspecialist' approach is perhaps evident in SNH's attempt to define the class of veracious types of woodland. SNH state that as 'Coniferous Woodland' has *'some perception of naturalness'* it should merit a Class 3, and that felled woodland is Class 2 *'low perception of wildness'.* Both are artificial man-made features within the landscape, and therefore should belong in Map 4, Lack of Human Artefacts.

3.11 The SNH Phase I 'Perceived Naturalness' methodology notes that the *"influence of cells within 250m of the [25m] target cell was considered"*[10] to take account of the visual influence of landcover within the surrounding landscape. Again this confuses: is the physical mapping of land cover a visual quality or a physical one? Mixing both can only result in subjective ambiguity, something presumably the use of a GIS precision approach is striving to avoid.

GIS desktop study findings not systematically confirmed by field work

[9] Page 1 of 6. SNH Phase I, Mapping Scotland's Wildness
[10] Page 2 of 6. SNH Phase I, Mapping Scotland's Wildness

3.12 Regarding the lack of field corroboration, an issue repeatedly raised by consultees, SNH imply that their staff that had 'local knowledge' corrected areas where anomalies were recognised in Phase III, as discussed in Chapter 7. This is not the same as assessment with a standardised, industry-recognised and auditable approach. It is a significant 'limitation' of the whole mapping exercise. With regards to Map 1, Perceived Naturalness, for example, SNH admitted that classification of land classes, based on the Cairngorms work, left … 'room for debate'. The system seems to ensure classes were well defined, only 5% error possible; however, ground-truthing demonstrates there are discrepancies that would be more significant than 5% (e.g., the A9 corridor). Response to consultation did not result in change to classes.

Questionable use of proxies or surrogates

3.13 SNH also conceded the concept of using 'surrogates' to approximate measures of wildness (i.e., 'proxies') was a fault with the method that they stated later phases would correct, inferring this might involve field work. SNH, by way of justification, state proxies were used to deliberately introduce simplicity to 'avoid duplication' and enable use of approximations of the attributes that wild land possess (i.e., land cover types equate to wildlife). Some key evidenced research (e.g., that wildlife is the strongest indication of wildness) was not used in the study. In the 'proxy' use of land cover as an indicator of wild life somewhat undermines the credibility of this attribute, as far more reliable information is available.

Adaptation of CAWL methodology from previous studies

3.14 SNH admitted that the methodology was adapted from other models; that the data sets were a mixed resolution and level of detail, and that the method model was only partially used, which we believe has resulted in some of the key anomalies. Chief amongst these is the fact the national wild land GIS study did not weight attributes, unlike the Cairngorms study. Because GIS data sell sizes are unequal and a possible mismatch in the comparison of data and there is a potential for the differently scaled attributes to produce distorted results. This would logically require correcting by weighting accordingly. The methodology relies on subsequent 'tuning' in Phase III to (partially) correct obvious faults.

Methodology explanations remain unclear

3.15 Albeit the CAWL methodology is largely a plain language statement (i.e., not technical), its wording and definitions are not fully explained and in some instances the logic of the explanations may not stand up to scrutiny. The methodology requires considerable further interpretation to make the principles behind the methods used to produce each layer clear. Without further information and explanation (or unless assumptions are made), it is in some instance not possible to follow the prescribed methodology and therefore does not serve its stated purpose as a *'non-technical'* methodology. For example, the method does not fully explain that land cover typologies are assumed to equate to wild life indicators – this is explained in the 'Response to Consultation' but not in the methodology. This 'proxy' is also not accurate, in our view, and may indicate large areas of land are 'wild' but in reality, a non-specialist may not perceive it as such because there is little sign of 'wild life'.

3.16 There are many assumptions within the scoring mechanisms, interpretation of which is expected to be made by users, (e.g. that the effect of draw down on reservoirs should be ignored as a perception of wildness). SNH admits the 256 colour scale distorts relative wildness, and thus assumptions are expected to be made to interpret the meaning and to make allowances for these distortions. The argument that the system used is 'not ideal' (inferring there is no alternative, however) is not defensible. To establish a new planning tool of the scale and importance of the CAWL, accurate empirical evidence is a clear requirement.

3.17 The use of mixed GIS cell size as referred to previously might additionally have affected accuracy of statistical averaging. Information in 100m cells is (presumably) averaged out over 16 no. 25m cells to produce the 5th map – *Relative Wildness* – which has a 25m cell resolution '*to avoid loss of data in 25m cells'*. In Map 4 – *'Lack of Built Human Artefacts',* differential measurement of turbines appears to introduce a weighting system to the criteria that is inconsistent with the claim no weighting has been used to map the attributes, i.e., using 100m cells and view sheds of 30km versus 25m cells versus 15km view sheds for other artefacts.

Logic and value of compilation of Map 5 - Relative Wildness

3.18 Notwithstanding the comments provided above regarding the appropriateness of the layers mapped to date, we consider it is essential to attach weights to layers but only if a map of relative wildness is necessary or appropriate in the

first place. Average scoring with equal weighting given to every layer may have resulted in certain characteristic being either over-or under-estimated in the mapping exercise. Why weighting has not been used is not adequately explained. The Cairngorms study recognised a need to re-balance the scoring system to avoid obvious over-or under-emphasis due to applying the computer generated scores uncritically on the ground. The SNH Phase I methodology unhelpfully weighting has not been used because '*an equal weight has been applied to all four layers'*.

3.19 SNH acknowledges the issue of simple addition of layers and that physical attributes analysed are not completely independent of each other. This is particularly problematic when two similar attributes are added together, which artificially elevates an area's importance. Within Phase II, the Jenks Natural Breaks Optimisation aimed to overcome simplistic nature of adding the 4 layers together. The problem of imbalance by duplication of scores remains, however. Areas adjacent to the A9 are considered to be wild, even if in view of the road. They quite obviously are not wild areas. The doubling of scores of other attributes is the likely cause of this anomaly. How extensively this anomaly affects the CAWL should be determined before the boundaries are frozen.

3.20 Using 'relative' wildness as a parameter to define the extent of wild land has simply fostered ambiguity. A more appropriate starting point for weighting layers might be to analyse the findings of the SNH survey into public perceptions of Wild Land and give greater weight to those characteristics which members of the public most associate with wildness, judging and scoring each element accordingly.

3.21 Whether a map of relative wildness is appropriate is also questionable in regard to the manner that the CAWL boundaries have been decided in Phases II and III. The process employed to draw CAWL boundaries did not adhere to the findings of the Phase I GIS nor Phase II Jenks Natural Breaks Optimisation process, relying on a range of *ad hoc* and broad-brush 'informed' judgements to loosely interpret them. Because of the incomplete nature of the study there are likely to be many exceptions to the wild land principle, opening the designated areas up to challenge from many perspectives.

2) Are the Phase I attributes appropriate indicators of wildness?

Map 1 – Perceived Naturalness

3.22 A large area of Map 1 is in the highest category but extensive features included in it dispel the notion of wildness (e.g. commercial coniferous plantations, tracks and managed moorland). The Perceived Naturalness map is an example of the flaw in the mapping system. It does not discern the difference between an area with a major 'A' road (e.g., the A9 trunk road between CAWL 14 and 15) adjacent to it and any land of higher class truly deserving of core wild land status. It needs field verification.

3.23 The wild land scoring system scales up a score between 1 and 5 to between 1 and 500 and then to between 1 and 256, is an example how the Phase I evaluation method might be prone to error. An example is the arbitrary distance used to define the extent of natural coastline; yet again, demonstrating that only by testing wild land identified by the GIS mapping process with field assessment can determine the actual extent of the area.

3.24 SNH agree the map does not consider on-going vegetation/moorland management reduces perception of wildness. Although it would require field verification, excluding this attribute is likely to have significantly affected the outcome of GIS study.

3.25 Tree cover types were captured in the Naturalness layer, not 'Absence of Built Human Artefacts' layer (i.e., scored once only) where they scored 3, 4 or 5 depending on type. SNH admitted this attribute scoring could only be confirmed by field work.

Map 2 - Rugged or Challenging Terrain

3.26 Map 2 reflects finer grained surface roughness not major landform, although 'there will a coincidence of these that comes through'.

3.27 SNH agree the map 2 attributes are not mapped directly but are accounted for in the *Remoteness* layer, (via extra time needed to traverse steep/boggy ground/dense shrub, heath and forest). These aspects are therefore scored once only.

3.28 SNH agreed the 50m cell resolution for Map 2 was anomalous with 25m cells used in other maps, but a pilot area tested the use of a lower resolution but it '*proved computationally difficult to upscale*' it. It remains an open question as to what effect the disparity of cell sizes have overall: '*what is the impact of*

'down-scaling?' it would seem to over-emphasise impacts in comparison to smaller cells.

3.29 Climate could be an important factor in balancing low, flat but boggy areas with high, steep exposed areas, reducing scores. This is a potentially important omission.

Map 3 – Remoteness from Roads

3.30 Mapping 'remoteness and/or inaccessibility', from the nearest 'point of mechanised access' is evident that this layer maps accessibility rather than remoteness as such. Barriers to accessibility have been modelled in (e.g. lochs and gradients of over 45 degrees). However this does not appear to account for the hypothetical situation for example where a walker has to walk for a considerable distance to navigate around a deer fence, which is not modelled, or a plantation, neither of which are wildness indicators but both creating inaccessibility and therefore scoring highly. Neither of the obstacles score low elsewhere, however, because plantations have a minimum score of 3 and are not mapped as human artefacts (where they would presumably score 1) and deer fencing is not mapped at all. This demonstrates how computer mapping without field-proofing or exclusion/misplacing of attributes is likely to lead to distortion of scoring.

3.31 Additionally, although it is an important 'proxy' of wildness, remoteness is more critical to sense of wildness than accessibility. It would have provided better accuracy if the two had been mapped separately, even as attributes on the same map; a point raised in the SNH Phase I consultation but not followed through.

3.32 The revised Phase I methodology states that distance and time are the factors required to evaluate remoteness, but it does not state how far or for how long you have to walk to be 'remote'. How inaccessible does a tract of landscape need to be or how far does one have to travel off roads and tracks before one gains a sense of wildness? This is an example of the frustrating opaqueness of the methodology; it does not state where the threshold is. It has to be taken on faith that the next phase of analysis has been undertaken by SNH correctly, even though we cannot follow how it has been arrived at.

3.33 The SNH Response to Consultation notes that a time delay has been factored into map 3 due to forestry acting as a barrier and therefore it is scored as a positive attribute, because it potentially results in an increased sense of

remoteness. However, forestry is also factored in Map I. This is another example of how 'double counting' could potentially have distorted the results.

Map 4 - Absence of Built Human Artefacts

3.34 As referenced in comments on Map 3 above, excluding features such as deer fencing, which is both a significant visual feature and due to their sometimes great and impenetrable length, significant barriers, potentially may have significantly affected the outcome of GIS study; even though it would require extensive resources to map, the scale and extent of this type of fencing strongly affects the sense of wildness.

3.35 Additionally, the 25m GIS cells should allow hydro-electric intake and infrastructure to be collectively mapped, but they have apparently been ignored because they are not large enough to be acknowledged within the GIS cell. Ignoring the crucial differences of the nature of the artefacts is a major flaw, particularly when considered collectively. Were this to be done, wildness scores in the vicinity of reservoirs, for example, would undoubtedly need to be reconsidered.

3.36 Coniferous plantations are also not included as Manmade Artefacts, but are included in the Map1 naturalness layer as discussed above. Our understanding is that they would have significantly influenced the extent of wild land had these features been considered a detractor (scoring presumably 1 in map 4) rather than neutral features, as it has been in Map 1, scoring a 3. Being factored in as another 'positive' feature, i.e., a barrier, in Map 3, again as discussed above, demonstrates that they have been double counted in the assessment.

3.37 The revised Phase I methodology states that the GIS mapping process was not able to differentiate reservoirs from natural lochs. Highland reservoirs have therefore been allocated a score of 5, fresh water, in Map 1, Perceived Naturalness. Although many of the reservoirs are difficult to tell apart from natural lochs or tarns on OS maps, major ones are unmistakable. They usually have a dam at one or even both ends (as in the case of Loch Ericht in Perth and Kinross), a feature that is readily discernible on Google Map and can be confirmed as such usually by reference to an on-line source. The man made features are subject to water management and are mostly accompanied by tracks and hydro-electric infrastructure. There is a strong possibility that the scoring these structures as 5, when they logically should be included as

Human Artefacts, will have resulted in significant errors in the scores of some core areas of wild land.

3.38 As was noted in the SNH Response to Consultation, exclusion of artefacts from Map 4 (i.e., deer fencing, reservoirs, hydro-electric infrastructure, and plantations) suggests their presence does not affect level of wildness. If the study is incomplete, however, the principles of CAWL mapping will not have been fully proven and defined on the ground. It is incorrect to use an incomplete study to shape a policy that is principle based and that will affect other national planning prerogatives such as renewable energy.

Map 5 – Relative Wildness

3.39 The SNH Phase I 'relative wildness' mapping provides a composite map of the four physical attributes within the SNH Phase I methodology. The very use of the word 'relative' requires a weighting method to compare one point of reference to another. Without weighting, if a human artefact is visible (or can be heard, smelt or felt) within the landscape, the perception or sense of wild land would be dispelled regardless of the other physical attributes being present or absent. We do not have the benefit of the GIS data sets as used by SNH to compile a compilation map, but it appears that when the four physical attributes were amalgamated to create the 'relative wildness' mapping the results were inadvertently distorted by 'double counting of some attributes and are therefore inaccurate

3.40 The SNH methodology states that "individual layers could be given greater or lesser emphasis by weighting their scores accordingly, although this has not been applied to date and an equal weight has been given to all four layers."[11] Figure A-11, '*Study Area Relative Wildness'* illustrates an example of the results of mapping ZTV's of human artefacts that include plantations and reservoirs as well as roads and building, in an area near the estate of Talladh-a-Bheithe, Perth and Kinross. It demonstrates that there is effectively very little land area that does not have a view of an artefact of human origin. Were the wildness qualities of such artefacts weighted, however, the 'relativity' of wildness could be clearly understood. It would be more appropriate if greater emphasis was placed on the visual influence of modern, man-made artefacts within Phase I, following GLVIA methodology.

3.41 We stand to be corrected if our understanding of the methodology as

[11] Page 4, Para 7. SNH Phase I, Mapping Scotland's Wildness

interpreted above is wrong; any confusion, however, must reflect on the lack of clarity of the methodology, a significant criticism in itself.

3) Does the Phase I methodology cover all aspects of defining wildness appropriately***?***

3.42 The scoring system relies on multiple assumptions; it also expects users to do so too. Some of these (e.g. that the effect of draw down on reservoirs should be ignored as a perception of wildness) are highly questionable. Indicating presence of wild life by the use land cover mapping as a 'proxy' somewhat undermines the credibility of this attribute, as far more reliable information is available, such as SNH's 'Attitudes to Biodiversity' survey (2009)[12]. Additionally, because hydro-power reservoirs (with associated intake infrastructure, pylons, draw-down scars and dams) are not identified as human artefacts (which would score negatively) but as 'fresh water' within Map 1, '*Perceived Naturalness'*, which scores positively, the distortion of scoring becomes clear.

3.43 Excluding consented (but not built) wind farms in the Built Human Artefacts layer may have additionally distorted the computer-generated scoring in a number of locations. However, this issue appears to have been corrected by Phase III as will be discussed later, albeit perhaps not transparently.

3.44 Likewise, the negative impact of plantations on overall scoring does not seem to have been addressed by Phase I and is managed by the Phase III process, and yet again in a not altogether transparent manner (see section 6 and 7). Because plantations were not captured in Map 4 (*Absence of Human Artefacts*), their negative impact on wildness was not fully acknowledged by Phase I. Because they were captured in Map 1 (*Perceived Naturalness*), they scored a neutral 3, being a form of land cover that is vegetation and therefore 'natural'. This ignores a very apparent set of facts regarding woodland plantations in the Highlands; they are for the most part, very unnatural in the context of visually regimented components of an intensely and commercially managed industry, every bit as much a human artefact as arable farm land (LCM2007 class 2) or a golf course (no LCM rank at all). These problems were also addressed by Phase III, where areas contained significant features that impacted negatively on attributes were apparently excluded from the

[12] e.g., National baseline survey of biodiversity awareness and involvement. Scottish Natural Heritage Commissioned Report No. 334 by Progressive Partnership Ltd. 2009

potential defined area of selection, but there is no clear statement confirming how SNH undertook this task.

3.45 Other aspects that may not have been accounted for but which influence perceptions of wildness, ruggedness, remoteness or absence of human artefacts include:

- *Climate data has not been mapped, although it might well have an impact on the sense of wildness.*
- *There has been no clarification of impact of abandoned buildings on scoring*
- *The omission of aquaculture, fencing and artificial drainage has not been amended*
- *Consented unbuilt development were not factored into the Human Artefact Map 4 (although the issues is dealt with by phase III)*
- *Exclusion of Beauly-Denny power line has not been amended, as far as can be discerned.*

3.46 The Phase I analysis should have allowed field verification of key areas (i.e., those where significant doubt about the quality of the results are identified). The updated methodology does not indicate that any systematic/corroborated or auditable field work was carried out. This is a significant omission in the study. Because of the incomplete nature of the study there are likely to be many exceptions to the principles set out to define and defend wild land, opening the designated areas to challenge.

3.47 Large areas lower quality wild land abutting the high class areas have been incorporated into the current 2013 designated areas. While initially it might seem that the sophistication and complexity of the GIS process has been designed to include *only* core areas, the effect of including low quality areas is to form an apron or buffer *around* the core areas. This is an example of inconsistencies in the methodology and its reliance on numerous quantative or qualitative assumptions used to decide scores and values for the various attributes that the mapping exercised measures.

Critical Review of Phase II Approach

3.48 The net result of Phase II/III was the maps A-N in Appendix VII. Visual comparison of the 'corrected' 2012 maps (A to G) to those prepared in February 2013 (H to N) show an increase in both the number and size of wild lands. This is contrary to expectations, as the revised Phase I methodology included criteria that should have reduced the areas by increasing the class quality thresholds.

3.49 Phase II - Mapping of new search areas of wild land – purports to test the 'relatively high levels of wildness found in the search areas identified in 2002'. Phase II introduces the Jenks Natural Breaks Optimisation (JNBO) statistical modelling tool to the mapping process. Although the methodology does not fully explain its application, JNBO is understood to be used to analyse large quantities of data to obtain patterns with robust rationale to support them. It provided a means of categorising the data derived from overlaying the four wild lands attribute maps to derive the 8 wildness classes. It would be a safe assumption that such a 'fine-grained' tool should be capable of being used to derive similarly 'fine grained' maps that delineate where the wild land areas are located, reducing the likelihood of error and criticism.

3.50 To recap the involved rationale used to map new search areas, the JNBO indicated that to be classified as the highest quality of core wild land class 8, an area needs to achieve a score of a score of 65%. Class 7 requires a minimum score of 56%; class 6 is above 48%; and class 5 is above 41%, which represents the median 'natural break'. It could be assumed that in terms ensuring wild land is 'core' relative wildness should be high quality, and that would be expected to be greater than a median score.

3.51 SNH chose wild land which scored above 56%, class 7 to be 'core'. This is a robust stance, one which would be difficult to argue with. The methodology, however, introduces a new concept at this stage – that '*wildness is a quality which augments progressively as you penetrate into wild land'*. It states that core areas could therefore include lower quality or classes.

3.52 The 'rules' introduced by Phase II made it clear that lower quality wild land could be 'swept up' with areas of higher quality land, because it suited the principle of progressive augmentation. It also followed the principle in the SNH methodology Para 6, in which the CAWL have to be of a minimum size to qualify for selection – 1000ha or 5000ha, depending on location.

3.53 It can be understood that a minimum size of land needed to be selected for it to qualify at CAWL. Why 1000ha was chosen is not made clear, and therefore it could be assumed this was an arbitrary decision. Why the land south of the Highland Fault should be exactly half that required to qualify as CAWL to the north of it is also not made clear, other than by claiming it is in a *'very different context…generally more settled and managed.'* It is likewise, arbitrary. This seems to be a poorly argued justification for changing criteria.

3.54 The arbitrary nature with which the selection of new areas of search methodology has been approached becomes even more apparent in Para 7; mall areas of relatively high wildness can, according to the method, also be 'swept up' to the next stage of the selection process. How small and what minimum quality are not stated. Para 8, headed 'Identify encompassing area of wildness that contribute to the whole', introduces more criteria that states areas of lower wildness surrounding highest wildness are an 'essential contributor to the whole'. This statement is arguable. It is a recognisable principle that National Parks and National Scenic Areas are acknowledged to have a landscape setting or context, but that the boundaries are not dependant on having an area or apron of lower quality land adjacent, either within or outside the designated area.

3.55 However, the selection criteria claims that class 5 land scoring as low as 41% - could be included. Class 5 CAWL might include pylons, tracks, hydroelectric reservoirs, plantation and other artefacts that would not contribute to a sense of wildness. The inclusion of this class of land would reduce the quality of experience and purpose behind selection as potential CAWL, and therefore the rationale and wisdom of proposing to do so should be questioned. There is a greater reason to do so once Phase III methodology is examined.

3.56 In summary, from the above it is clear that Phase II methodology provides a mechanism to coalesce low quality areas together with small fragments of higher quality to form areas that are larger than could be justified by the Phase I criteria, despite the relatively robust selection process that the latter provided. The arbitrary nature of the addition of Phase I 'rules' is a cause for concern, and how the low quality aprons or buffers could be annexed to core areas of wild land is clearly identifiable.

Critical Review of Phase III Approach

3.57 The final boundaries were drawn up by application of 'informed judgement' to re-interpret the GIS data of Phase I and application of rules in Phase II was supported by guidelines, but which might equally be interpreted as 'exceptions'. It is incongruous that the detailed and crafted justifications of Phase I, flawed though much of it was, were over-ruled by largely subjective opinion to define the mapping of CAWL, and at an even cruder scale than the GIS data. The process allowed significant increases in some of the mapped 2012 CAWL.

3.58 Map K – core areas of wild land 2013 with classes of wildness and National Parks and NSAs illustrates the extent of the three highest classes – 6, 7 and 8 – in relation to the full extent of the wild land boundaries as well and NP and NSA boundaries). It is presumed than only the highest grades are included because these are deemed 'significant', while classes 3 - 5 are below the threshold for inclusion (see Figure 3). Detailed examination of the map confirms significant areas of wild land are not the highest classes. While elsewhere explanation is provided as to why this is the case, i.e., it is practical to link two areas of high class land if they are in close proximity and large enough, there are also a number of areas where areas below Class 6 included within the potential CAWL boundaries do not link with any other area of significance (e.g., the A9 corridor).

3.59 How the thresholds would be applied in determining impacts of new development is not specified. It seems that if any one of the attributes is impacted by a proposed development, then it would compromise the integrity of CAWL and therefore would not be permitted. Yet the guidelines advise the boundaries should be thought of as 'fuzzy', which presents further anomalies and lack of clarity.

3.60 The maps have, however been drawn at a relatively coarse 1:50,000 scale. It similarly does not seem to capitalise on the use of relatively fine grained (25m cell) GIS mapping as described in the Phase 1 identifying Relative Wildness Non-Technical Methodology, which should be usable as a reliable analytical tool in its own right by professional assessors. The documents are in the public domain and should therefore be accessible and clear to all levels of user, and their rationale should be immediately apparent. This is not the case.

3.61 In practice the approach taken by SNH to mapping wild land relies on perceptions of wildness that are inherently subjective. While statistical analysis has been used extensively in developing the criteria, there is no evidence that a commonality of perception has been applied.

3.62 If opinions (or informed judgement) over-or under-emphasise particular attributes that are emotive (i.e., not physically measurable), results may be distorted unless this is taken into account. For example, reservoirs may subjectively appear natural and have been classed as such (scoring a maximum 5), but due to collective associated hydroelectric infrastructure (e.g. pylons, plant rooms, access tracks, water intakes, tide marks, and dams), they are obviously human artefacts. A shooting estate covered by grouse moorland may subjectively be perceived as natural, but is totally man-made by on-going land management systems that may actively prevent the natural regeneration of woodland. The same applies to commercial forestry; regardless if it broad leaf or conifer; a plantation is likely to be planted in linear or regular layout and enclosed by deer fencing and therefore is essentially a human artefact. The flaw caused by not weighting of such attributes is that they are scored not according to their physical properties but by a subjective judgement. Scoring on a subjective basis as this system does, is therefore prone to inaccuracy unless weighting is used. The Cairngorm wild land model recognised this.

3.63 Overall, the questions and criticisms raised above with regard to the approach taken to all three phases of the development of the Core Areas of Wild Land Map provide evidence that the Map as it currently stands is not an accurate reflection of the true areas of wild land.