

The Visual Amenity Value of Urban and Peri-Urban Woodlands in Iceland

A Helliwell System Approach: Establishing Baseline Values and Introducing the Icelandic Woodland Amenity Classification (IWAC)

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NOVEL FRAMEWORK
IWAC
Icelandic Woodland
Amenity Classification

BACKGROUND & CONTEXT

Iceland's Forest

Woodlands are critically important with in towns and cities, they provide a range of ecosystem services, with cultural benefits being especially significant (Berglinh, E.C & Gómez-Baggethun, E., 2021). These include aesthetic enjoyment, psychological restoration, and recreational opportunities that are fundamental to quality of life (Wang et al., 2022; Cretan et al., 2024; Þirselimöglu Batman & Ender Altay, 2025). In Iceland, even with limited forest cover, woodlands have become significant landscape features and offer various cultural services (Eysteinnsson, 2017). Over the past 35 years, areas of forests for social services increased by 245%. Leisure is now the most valuable product of Icelandic forests (FAO, 2010; FAO, 2025). Visitor numbers have also grown. For instance, between 2008 and 2018, annual visitors to Heiðmörk, a peri-urban forest, rose from 189,700 to over 500,000 (Curl, 2008; Cook et al., 2018).

Kristjánsdóttir et al. (2020) demonstrated that engagement with Icelandic forests leads to improvements in mental state, including increased relaxation, peacefulness, and cognitive clarity. Physiological evidence through randomised controlled trials has documented reduced cortisol levels and enhanced positive affect following forest exposure in Reykjavík (Olafsdóttir et al., 2018). These benefits primarily result from passive interactions, such as visual observation of vegetation, auditory engagement with natural sounds, and quiet contemplation, which support effects similar to those of meditation (Svanbergsson et al., 1988; Baldursdóttir, 2021; Hallgrímsson, 2025).

The aesthetic contribution of forests to Icelandic landscapes is similarly well-documented. Research indicates that visitors prefer scenes with approximately 50% forest cover, with visual harmony between forests and the surrounding landscape valued (Curl, 2008; Lange, 2016). Visual landscape quality appraisal frameworks adapted for Iceland confirm that vegetated habitats contribute positively to landscape quality scores (Swetnam & Tweed, 2018). Within urban areas, trees create healthier, more attractive, and liveable environments, with Reykjavík's urban amenity trees holding significant value (Shearer & Slater, 2025; Konijnendijk et al., 2025). These aesthetic and restorative benefits position urban woodlands as essential infrastructure for public health and quality of life, yet their systematic assessment remains underdeveloped in the Icelandic context.

Visual Equity Deficit: Only 39% of Iceland's buildings satisfy the 3-tree visibility criterion — versus 83% Nordic mean (Konijnendijk et al., 2025). This systematic deficit underscores why accessible, high-amenity woodland is a public health priority.

The Helliwell System

Originally devised in 1967 and revised to its current form in 2008, the Helliwell System is a visual amenity valuation methodology currently accepted in British courts (Helliwell, 2008). It evaluates woodlands through six standardised scoring factors, multiplied together to yield a composite amenity value. The multiplicative — not additive — design is deliberate: a woodland fundamentally deficient in any single dimension cannot achieve a high overall score regardless of performance elsewhere. This makes the system particularly robust for management prioritisation.

REGIONAL SUMMARY

Region	n	Pop. Density (persons/km ²)	Mean Area (ha)	Mean Helliwell (pts/ha)
North	6	1,500	66.1	22.0
East	3	628	204.1	20.8
Capital	9	2,677	139.5	18.2
South	4	313	31.2	17.9
West Fjords	3	895	21.3	12.2
West	3	1,662	29.0	8.6
S. Peninsula	1	1,413	11.5	4.9

Colour coding: ≥30 pts/ha (dark forest) · 10–29 pts/ha (green) · <10 pts/ha (amber). Source: Shearer, A.Z. (2025).

METHODOLOGY

29 sites distributed across all seven Icelandic geographical regions were assessed during the growing season (June–September), selected for variation in population density, landscape character, and urban/peri-urban classification. Urban areas: Statistics Iceland criteria (≥200 residents; defined street network; housing density thresholds). Peri-urban zones: 2 km buffer from urban boundaries (Nilsson et al., 2001). Spatial processing: QGIS. Statistical analysis: RStudio.

Factor	Status	UK Max. Criterion	Iceland Adapted Criterion
Viewing Population	Modified	Modified	>100 persons/day → 4 pts
Other Trees Present	Modified	Modified	<1% surrounding cover → 4 pts
Composition/Structure	Modified	Modified	Veteran trees present → 3 pts
Size	Retained	Retained	Unchanged
Position in Landscape	Retained	Retained	Unchanged
Landscape Compatibility	Retained	Retained	Unchanged

Three of six Helliwell factors required recalibration for Icelandic ecological and demographic conditions:

Factor	0.5	Points			
		1	2	3	4
i. Size of woodland	Very small	Small	Medium	Large	
ii. Position in landscape	Very secluded	Secluded	Visible, but not prominent	Prominent	Very prominent
iii. Viewing population	Very few	Few	Many	Many	Very many
iv. Presence of other trees and woodland in the vicinity	Surrounding area more than 75% wooded	Surrounding area more than 25% wooded	Surrounding area 5–25% wooded	Surrounding area 1–5% wooded	Surrounding area less than 1% wooded
v. Composition and structure of the woodland	Plantation with geometric stripes, or visually degraded woodland	Even-aged young woodland	Mature or uneven-aged woodland or wood pasture with large or veteran trees	Mature or uneven-aged woodland	Surrounding area less than 1% wooded
vi. Compatibility	Only just acceptable	Acceptable	Moderately good	Good	Excellent

Helliwell, 2008

ABSTRACT

Abstract

This study presents a systematic assessment of visual amenity value for urban and peri-urban woodlands in Iceland, employing an adapted Helliwell System methodology calibrated for Icelandic conditions. Assessment of 29 woodland sites across seven geographical regions revealed substantial heterogeneity, with Helliwell scores ranging from 0.34 to 48.6 points per hectare. Urban woodlands demonstrated significantly higher median amenity intensity (11.6 pts/ha) compared to peri-urban counterparts (6.9 pts/ha). Composition/Structure and Landscape Compatibility were identified as primary constraints, whilst Position in Landscape and Viewing Population distinguished high-performing sites. No significant correlation emerged between woodland extent and per-hectare amenity intensity, indicating that qualitative characteristics exert greater influence than total area. The IWAC classification framework translates these findings into actionable management categories applicable to post-deforestation landscapes.

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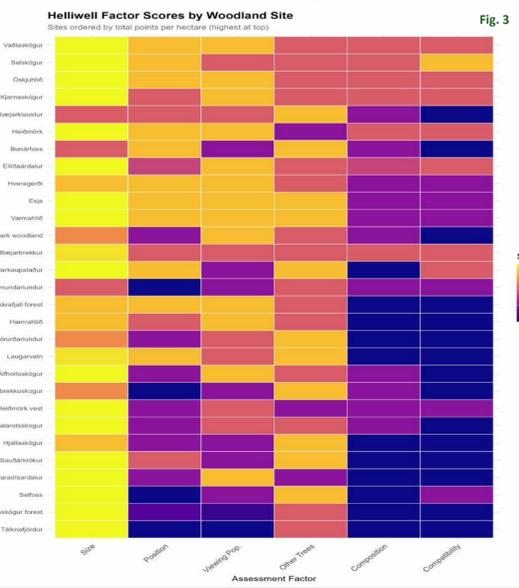
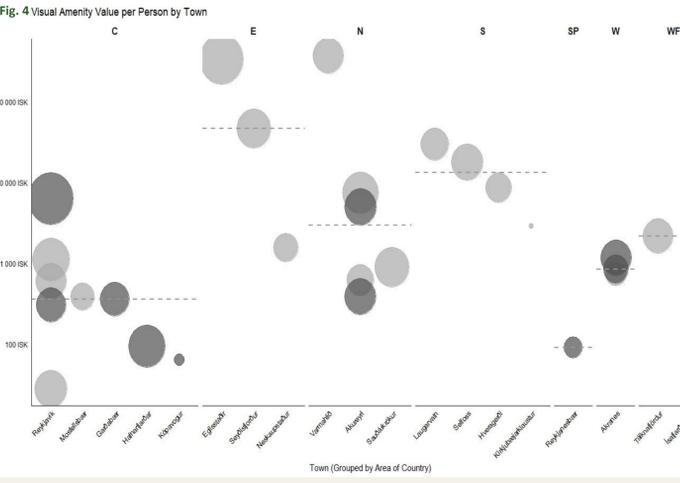
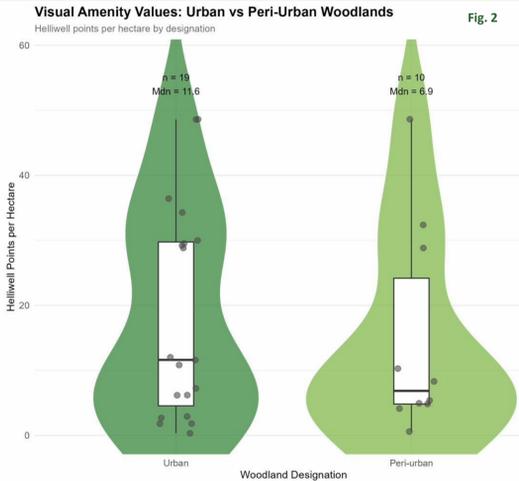
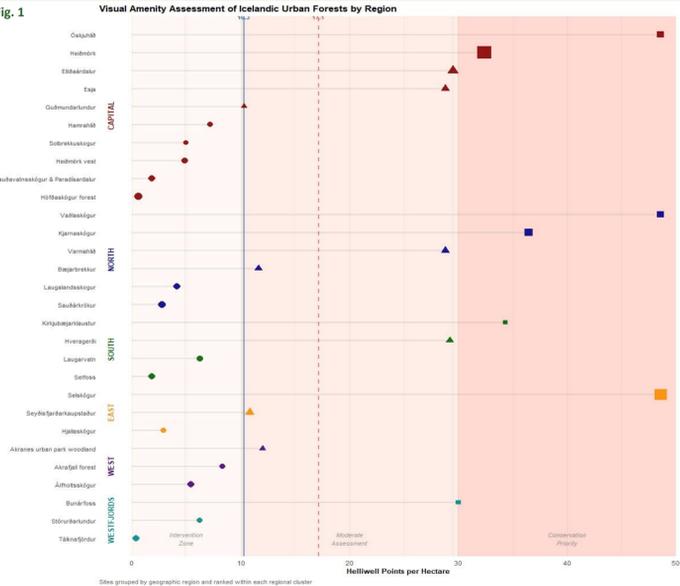
Þessi rannsókn kynnir fyrsta kerfisbundna mat á sjónrænu yndisgildi þéttbýlis- og skóga nærri þéttbýli á Íslandi, með aðlagðri Helliwell-aðferðaræði sem er kvörðuð fyrir Íslenska aðstæður. Mat á 29 skógarsvæðum í sjö landshlutum leiddi í ljós verulegan breytileika, með Helliwell-stig á bilinu 0,34 til 48,6 stig á hektara. Þéttbýlisskógar sýndu marktækt hærri miðgildi yndisstyrkleika (11,6 stig/ha) samanborið við skóga nærri þéttbýli (6,9 stig/ha). Greining á þáttum leiddi í ljós að Samsetning/Bygging og Landslagssamræmi voru aðalþakmarkanir, en Staðsetning í landslagi og Áhorfendafjöldi á aðgreindu svæði með hátt gildi. Engin marktæk fylgni kom fram milli skógarstærðar og yndisstyrkleika á hektara, sem bendir til þess að eiginlegir þættir hafi meiri áhrif en flatarmálið eitt og sér.



RESULTS



Assessment across 29 sites revealed marked positive skewness (median 10.3 pts/ha; mean 17.2 pts/ha). **Composition/Structure** limited amenity at 48.3% of sites (factor score ≤1) and **Landscape Compatibility** at 58.6% — directly reflecting Iceland's young plantation-dominated forest resource. Urban woodlands achieved significantly higher median per-hectare scores than peri-urban counterparts (11.6 vs. 6.9 pts/ha). Critically, **no significant association emerged between woodland area and per-hectare amenity intensity** ($r = 0.18$, $p = 0.34$): qualitative enhancement yields greater amenity returns than expansion alone. Whilst the aim of this study is to provide a mechanism to guide management, it is possible to utilise the ascertained Helliwell points to conduct a further step to convert the points scored into a monetary value. The current value set by the Arboricultural Association (January 2025) for woodlands is GBP 208.44 per point (Arboricultural Association, 2025). Across all 29 measured sites, an average of 17.2 points per hectare was estimated. Current reporting indicates that there are 11,070ha (FAO, 2025) of urban forest in Iceland, giving an estimated value of 40 million Pound Sterling or 6.7 billion Icelandic Kronur (2026 conversion rate of 1 GBP to 170 ISK). It should be noted that this monetary value is used within the U.K. legal and planning system, and as such, it is unclear how this fully converts to Iceland at this time.



IWAC: A NOVEL CLASSIFICATION FRAMEWORK

The IWAC adopts the cascade categorisation architecture of BS5837:2012 and EAS 06:2025 — sequential quality thresholds, subcategory profiling, and differentiated management priorities — whilst replacing their age-dependent valuation basis with **landscape-based visual amenity assessment**. The Helliwell System is suited to this substitution: its factors evaluate what a woodland contributes to the landscape in its current state, not its chronological maturity. A 50-year-old birch woodland in a prominent landscape position with appropriate compositional diversity can achieve scores equivalent to those of a mature British oakwood — providing the parity of treatment that Iceland's young forest resource requires. Roman numeral designations (I–IV) signal an independently developed framework; the Icelandic alphabet lacks the letter C, rendering letter-based BS5837/EAS categories linguistically inappropriate for an Icelandic management instrument.

CASE STUDY: Öskjuhlíð, Reykjavík — February 2025

Under initial assessment, Öskjuhlíð (Capital) achieved IWAC Category I (48.6 pts/ha). Following a February 2025 clear-felling event — in which 2.8 ha containing approx. 1,500 trees were removed for airport safety requirements — Composition/Structure and Landscape Compatibility both dropped to 1, triggering reclassification to IWAC III. Under a conventional BS5837/EAS age-based assessment, the remaining young trees would have offered equivalent (low) protection regardless. Under the IWAC, the loss is directly quantifiable and causally linked to the management intervention, providing planners with an evidence base for evaluating impacts before implementation.

I IWAC I · ≥30 pts/ha
High Visual Amenity · Priority Retention · 5 sites (17%)
No individual factor scoring below 2 — reflecting broad-based quality across all six assessment dimensions. The 30-point threshold is achievable only where all multiplicative factors perform at or above median levels; the factor quality criterion mirrors BS5837/EAS cascade logic in which a severe deficiency in any dimension prevents the highest classification. Management implication: priority retention; statutory consideration under Cultural Heritage Act No. 80/2012; minimum disturbance principle applies to adjacent development proposals.

II IWAC II · 10–30 pts/ha or ≥30 with factor at 1
Moderate Amenity · Active Enhancement · 10 sites (34.5%)
Encompasses woodlands of demonstrable but constrained visual quality. Notably, Kirkjubæjarklaustur (34.3 pts/ha) and Bunárfoss (30.0 pts/ha) exceed the 30-point threshold but are assigned Category II due to Landscape Compatibility factor scores of 1 — demonstrating the classification's capacity to identify targeted management deficits within otherwise high-performing profiles. Primary management levers: species-mix diversification; edge treatment for landscape integration; enhanced public access provision.

III IWAC III · <10 pts/ha
Low Amenity · Structural Transformation · 14 sites (48.3%)
Woodlands typically exhibiting two or more factors at minimum values, reflecting even-aged plantation structures poorly integrated into the wider landscape. Sites with moderate Landscape subcategory scores but poor arboricultural quality; 'Structural Transformation'; systemic limitations across both subcategories; 'Strategic Review'. Nature Conservation Act No. 60/2013 obligations apply where native species assemblages are present. Long-term replanting plans and continuous cover forestry approaches indicated.

IV IWAC IV · Condition-based — not score-determined
Specialist Assessment Required · Not assessed in this study
Corresponds to BS5837 Category U and EAS Category D — woodlands unsuitable for retention due to structural failure, irreversible phytosanitary decline, or approved removal. Not determinable from Helliwell scores; requires independent arboricultural assessment of structural viability. Category IV completes the classification cascade for comprehensive woodland management application and is a necessary extension for future site-level work.

IWAC SUBCATEGORY FRAMEWORK

- Arboricultural Qualities**
Size · Composition/Structure · Other Trees Present
High ≥3.0 / Moderate ≥2.0 / Low <2.0 (mean factor score)
- Landscape Qualities**
Position in Landscape · Viewing Population · Landscape Compatibility
High ≥3.0 / Moderate ≥2.0 / Low <2.0 (mean factor score)
- Cultural Values**
Statutory protection status
Cultural Heritage Act or Nature Conservation; natural birch woodland under

Combined classification (e.g. II/1,2): category × subcategory intersection yields differentiated guidance — Protect & Maintain (I) · Targeted Enhancement (II, constraints) · Enhance & Monitor (II, balanced) · Structural Transformation (III, moderate landscape) · Strategic Review (III, systemic).

CONCLUSIONS

This study establishes a systematic baseline of visual amenity values for urban and peri-urban woodlands in Iceland, demonstrating that structural immaturity — not spatial extent — is the primary determinant of amenity intensity. The IWAC provides a replicable, non-monetary classification framework bridging Helliwell assessment and actionable management guidance, adapted for post-deforestation landscapes where established age-based standards cannot be applied. By grounding the classification in Icelandic legislation and translating scores into management categories with differentiated intervention priorities, the framework supports evidence-based urban forest governance. The approach has broader international applicability wherever young forests require assessment frameworks that evaluate current landscape contribution rather than accumulated age.

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