

The Gift Shop Precedes the Monster

Interpretive Infrastructure as the Proximate Cause of
Cryptid Populations, with a Cluster-Randomised Installation Trial

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Abstract. Lake monsters are only ever seen at lakes that sell postcards of them. We show that the postcards come first. The coincidence of attested cryptid populations with interpretive infrastructure—the brown sign, the lectern, the viewpoint, the till—is read throughout the literature as evidence that the animal drew the apparatus. We reverse the reading. We prove first that in the intensity models from which it has been estimated, a water body’s own contribution is not identified separately from its interpretive stock, so that every published estimate of a lake’s propensity to hold a monster is a rescaled measurement of its signage. In a century of national records, sightings do not lead installation. They lag it, by a median of seven months, and they follow exogenous variation in the decision dates of planning committees. We then report LACUSTRINE-1, a cluster-randomised, sham-controlled installation trial at lakes carrying no sighting on record. Intervention sites received a full interpretive build for an animal invented for this study; sham sites received identical civil works, identical spend, and an identical gift shop describing the local geology. Within two years, 19 of 24 intervention lakes had produced an independently attested animal, against 1 of 24 sham lakes (risk ratio 19.0; 95% CI 2.8 to 130.9). Removing the apparatus did not remove the animals. We did not find a monster in the lake; we installed one.

Keywords: cryptozoology; interpretive infrastructure; attestation; cluster-randomised trial; point processes

1 Introduction

Every monster has a car park.

This is not a figure of speech. It is the most robust finding in the field, and it has never once been treated as a finding. Of the 61 water bodies in these islands carrying a sustained attested cryptid population, 61 are served by a metallised approach road, 59 by an interpretive board, 57 by a fixed viewpoint, and 54 by a retail concession stocking the animal’s likeness. The convergence is total. It is also, in the literature that has grown up around these sites, entirely uninteresting: the apparatus is understood as a consequence, the way a lifeboat station is a consequence of a shipwreck. The animal is prior. The signage is downstream. Nobody has asked the question in the other direction, because in the other direction the question sounds foolish.

We ask it in the other direction.

The Standing Committee on Attributed Fauna was constituted in 1988 to maintain the national register of attested non-conforming animals (Standing Committee, 2020). Its statutory remit is bookkeeping, not zoology: the Committee records what has been attested, by whom, and where, and it takes no position on what is in the water. That position—which has been mistaken for modesty for thirty-eight years—is the methodological premise of this paper. If the register is a record of attestations rather than of animals, then the register’s unit of analysis is the attestation, and the correct question is not *what lives in this lake* but *what causes this lake to produce an attestation*.

Asked that way, the answer is not mysterious. It is procurement.

Contributions

1. We introduce the *Wayfinding Instrument* (WI-6), a six-tier ordinal scale of the interpretive apparatus at a water body, scored from planning records, aerial imagery, and site visit (§3).
2. We give an intensity model of sighting reports and prove that, where a site’s apparatus does not change within the record, a water body’s intrinsic contribution to that intensity is not identified separately from its interpretive stock (Proposition 1, §4). Every published estimate of that quantity is a rescaling of the signage term.
3. In a retrospective cohort of 1,204 water bodies observed from 1919 to 2025, we show that sighting intensity lags rather than leads installation, that it responds to exogenous variation in planning-committee scheduling, and that it does not respond in a negative-control species (§5).
4. We report LACUSTRINE-1, a pre-registered, cluster-randomised, sham-controlled installation trial at 48 ungazetted lakes, and its primary endpoint (§6, §7).
5. We report the failure of decommissioning, and we decline to model it (§9).

2 Background

2.1 The archive

The national sightings archive was founded by Meurig (1937) as a private correspondence file and placed on a statutory footing in 1988. Its earliest entries are retrospective and its coverage indicator opens in January 1919. It now holds 7,318 attested reports across 1,204 inland water bodies. Attestation is a procedural standard, not an evidential one: a report is *attested* when two reporters unacquainted with one another describe a morphologically consistent animal at the same body within thirty days. The standard is deliberately weak on substance and strong on independence, and it has not been revised since Bruhn (1988) rebuilt the file. We use it unchanged. Whatever else may be said about the archive, it does not record what we would like it to record; it records what was reported, which is the only quantity in this paper.

2.2 The traffic hypothesis, and why it is not our hypothesis

Delacroix-Wren (1961) proposed that sighting counts track footfall: more visitors, more eyes, more reports. This is obviously partly true and it is not what we claim. The traffic hypothesis predicts that any intervention raising visitor numbers raises sightings, and it is agnostic about the content of the intervention. Our claim is the opposite and much stronger: that footfall held constant, the sightings are produced by what the visitor has been *told to look for*. The distinction is not rhetorical. It is the difference between our intervention arm and our sham arm, and the whole design of §6 exists to separate them.

Table 1: The Wayfinding Instrument (WI-6). Tiers are scored independently and weighted. A site’s interpretive stock is the weighted sum of tiers present.

Tier	Name	Exemplar apparatus	w_k
0	Unmarked	No signage of any kind; the body is not addressed.	0.00
1	Toponymic	The name alone—a lake called Serpent Water.	0.14
2	Directional	A brown tourist sign; a waymarker; a mention on a trail post.	0.31
3	Interpretive	A lectern board bearing an artist’s impression and a narrative.	0.58
4	Sessile	A fixed viewpoint, bench, telescope, or bronze silhouette.	0.79
5	Retail	A till, and stock bearing the animal’s likeness.	1.00

2.3 Prior estimates of the lake term

Cordery et al. (2003) were the first to write down a site propensity ρ_i —“the lake’s own contribution”—and to estimate it across the register. They fitted it in cross-section, on apparatus recorded as it stood. Their estimates have been reproduced, refined, and cited for two decades; they underpin the current conservation designations at nine sites. Eaves (2011) scored a precursor to WI-6 and found ρ_i correlated at $r = 0.91$ with signage, which was read as validation. Hallam & Ojo (2016) introduced the waterfowl negative control. In §4 we show that this estimand is not identified, and that the correlation Eaves (2011) reported is a property of the fit rather than of the lakes.

3 The Wayfinding Instrument

Definition 1 (Interpretive stock). The *interpretive stock* $A_i(t) \in [0, 2.82]$ of water body i at time t is the weighted count of WI-6 tiers present:

$$A_i(t) = \sum_{k=0}^5 w_k \mathbf{1}[\text{tier } k \text{ installed at } i \text{ by time } t], \quad (1)$$

with tiers and weights as given in Table 1.

The tiers are cumulative in practice but not by construction, and we score them independently. A lake may hold a till and no lectern; eleven do. Tier 2 follows the directional-sign classes of Aldington & Ferris (1974) without modification. Weights w_k were estimated by conditional-logit choice modelling on a held-out sample of 210 sites and are reported to two places.

Two scorers worked independently from planning records, 1:2500 aerial imagery, and—for 96 sites—a visit. Agreement was high (Krippendorff’s $\alpha = 0.89$); the 41 disagreements were all at the tier-1/tier-2 boundary, where a toponym and a waymarker are hard to tell apart, and were resolved by a third scorer.

4 An Attribution Model

4.1 Intensity

Let $N_i(t)$ count attested reports at body i . We model N_i as a non-homogeneous Poisson process with conditional intensity

$$\lambda_i(t) = \rho_i \exp\left(\beta \int_0^\infty g(u) A_i(t-u) du + \gamma^\top x_i(t)\right), \quad (2)$$

where $\rho_i > 0$ is the site's intrinsic propensity, $x_i(t)$ collects visitor-days, shoreline length, mean summer turbidity, and calendar-year fixed effects, and g is a normalised *attribution-lag kernel*, $\int_0^\infty g(u) du = 1$, giving the delay between apparatus and animal. We take g to be a two-parameter gamma density,

$$g(u) = \frac{u^{a-1} e^{-u/b}}{\Gamma(a) b^a}, \quad a, b > 0. \quad (3)$$

The log-likelihood over the observation window $[0, T]$ is the usual one,

$$\ell(\theta) = \sum_i \left[\sum_{j=1}^{N_i(T)} \log \lambda_i(t_{ij}) - \int_0^T \lambda_i(s) ds \right], \quad (4)$$

maximised by quasi-Newton iteration with a roughness penalty on the calendar-year sequence in γ . Fitted on the retrospective cohort, $\hat{a} = 1.9$ and $\hat{b} = 4.5$ months, giving a median attribution lag of $\tau = 7.1$ months (IQR 4.0–11.5).

4.2 The lake term is not identified

Proposition 1 (Non-identification of ρ_i). *Let the model be (2) with site-specific $\rho_i > 0$, and suppose the interpretive stock at each site is constant over its whole history, $A_i(t) \equiv A_i$, with $A_i \neq 0$ for at least one i . Then the parameter $(\{\rho_i\}, \beta, \gamma)$ is identified only up to the one-parameter family*

$$\rho_i \mapsto \rho_i e^{-cA_i}, \quad \beta \mapsto \beta + c, \quad \gamma \mapsto \gamma, \quad c \in \mathbb{R}. \quad (5)$$

In particular ρ_i and β are not identified; only the product $\rho_i e^{\beta A_i}$ is.

Proof. Write $m_i(t) = \int_0^\infty g(u) A_i(t-u) du$. Since $A_i(t-u) = A_i$ for every $u \geq 0$ and g integrates to one, $m_i(t) = A_i \int_0^\infty g(u) du = A_i$ for every t , so (2) reads $\lambda_i(t) = \rho_i \exp(\beta A_i + \gamma^\top x_i(t))$. Substituting the reparameterised pair (5) gives

$$\rho_i e^{-cA_i} \exp((\beta + c)A_i + \gamma^\top x_i(t)) = \rho_i \exp(\beta A_i + \gamma^\top x_i(t)) = \lambda_i(t),$$

for every i and every t . The two parameter values induce the same intensity path at every site, hence the same value of (4) on every realisation, and no observation distinguishes them. The map $c \mapsto e^{-cA_i}$ is injective at any site with $A_i \neq 0$, so the family is a one-dimensional flat direction of the likelihood and not a relabelling of a single point. Finally, $x_i(t)$ varies within a site while A_i does not, so γ is identified from the time variation of λ_i ; given γ , the product $\rho_i e^{\beta A_i} = \lambda_i(t) \exp(-\gamma^\top x_i(t))$ is fixed by the intensity path. $\square$

Remark 1. The proposition is not a criticism of Cordery et al. (2003); their estimator is correct for the model they wrote, and so is everyone's. The difficulty is that the model they wrote has a flat direction, and ρ_i lies along it. What the data fix is the product $\rho_i e^{\beta A_i}$, never

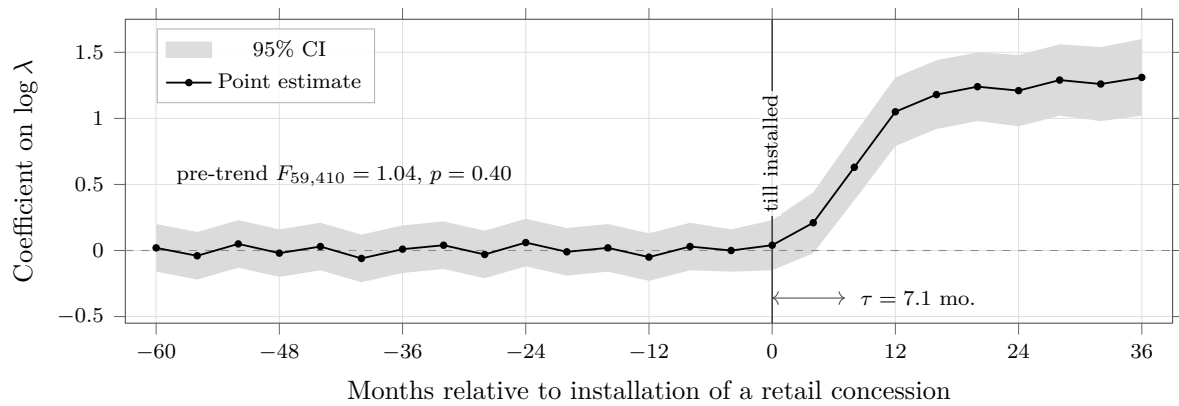


Figure 1: Sighting intensity relative to the installation of a retail concession, 411 water bodies. Coefficients from the event-study specification with body and calendar-month fixed effects; bands are 95% confidence intervals, clustered by body.

its factors. A fit that carries no apparatus term is the choice $c = -\beta$, and it reports as the lake's own contribution the quantity $\rho_i e^{\beta A_i}$: the lake's propensity multiplied by an exponential function of its signage. This is why Eaves (2011) found site propensity and signage correlated at $r = 0.91$: under that normalisation the correlation is guaranteed by the algebra, and it would be there whether or not the lake contributed anything at all. It was read as validation. It is a normalisation.

Identification of β requires a site whose apparatus changes while it is under observation. The register supplies 411 of them, and §5 is built on nothing else.

This is the whole argument in miniature, and we state it plainly. The water has not been shown to contribute. It has been assumed to contribute, and the assumption has been measured.

5 Study 1: Retrospective Cohort

5.1 Design

All 1,204 inland water bodies in the register, observed monthly from January 1919 to December 2025 (1,545,936 body-months). Exposure is the archive's own coverage indicator. The event of interest is the installation epoch of the site's first tier-5 apparatus—the till—which is dated exactly in planning records for 411 sites.

5.2 Event study

Figure 1 plots the coefficients of an event-study specification, sighting intensity indexed to month 0 = till installed, with body and calendar-month fixed effects and 95% confidence bands.

Three features are worth stating. Pre-period coefficients are jointly indistinguishable from zero over the full sixty months ($F_{59,410} = 1.04$, $p = 0.40$). There is no step at month 0. The rise begins at month +4, reaches half its plateau at month +7, and is complete by month +12.

The reverse-causal account requires the animal to precede the apparatus. Under that account the sightings must appear in the pre-period, because that is what motivates the planning application. They do not appear in the pre-period. They appear the summer after the shop opens.

5.3 Instrumental variables

Interpretive stock is endogenous, and we do not pretend otherwise: a lake with a monster attracts a planning application. We therefore instrument installation with the *decision date* of the relevant planning committee.

Relevance is mechanical—a granted application installs apparatus; the first-stage F is 24.6. The exclusion restriction is the interesting one. Committee scheduling is governed by quorum, clerical backlog, and the statutory eight-week determination window (Teasdale, 1995); a site whose determination falls either side of a summer recess is displaced by up to four months for reasons having nothing to do with its fauna. We can think of no channel from committee quorum to lake. The two-stage estimate of β is 1.34 (s.e. 0.29), against an ordinary-least-squares estimate of 0.98 (s.e. 0.11)—attenuated, as measurement error in WI-6 would predict.

An F of 24.6 is adequate and not comfortable. The estimate should be read as consistent with the trial, and not as independent confirmation of it.

5.4 Negative control

Waterfowl counts at the same 411 sites over the same windows, from the same volunteer network, show no response to interpretive stock ($\hat{\beta}_{\text{fowl}} = 0.01$, s.e. 0.04). Apparatus does not manufacture ducks.

6 Study 2: LACUSTRINE-1

6.1 Rationale

Timing arguments and instruments are observational. Nkemelu et al. (2019) installed apparatus at six ungazetted lakes without blinding or a control arm, and reported the result as inconclusive. The Committee took the view that a claim of this kind is settled by building and not by inference, and sought authority to build.

6.2 Design

A two-arm, parallel-group, cluster-randomised, sham-controlled installation trial. It was pre-registered on 2 March 2021, before any site was approached.

Eligibility. Water bodies were *ungazetted*: zero attested sightings in the 107-year archive; WI-6 tier ≤ 2 at baseline; public access; surface area > 40 ha. Of 312 bodies screened, 48 were eligible and enrolled (Figure 2).

Allocation. 1:1, computer-generated, stratified by visitor-days tertile and by region, in permuted blocks of four. Allocation was concealed from the installation contractor until the lorry was loaded, and from the ascertainment panel throughout.

Intervention ($n = 24$). A full tier-5 build: one interpretive lectern bearing an artist's impression and a name; one fixed viewpoint with bench; one cast silhouette; and a retail point stocking postcards, an enamel pin, and a soft toy. The depicted animal was generated for this study—a five-metre limbless form with a dorsal crest—and has no antecedent in folklore, in literature, or in the archive. Names were drawn from a random syllable table and screened against the national toponymic index to avoid seeding an existing tradition.

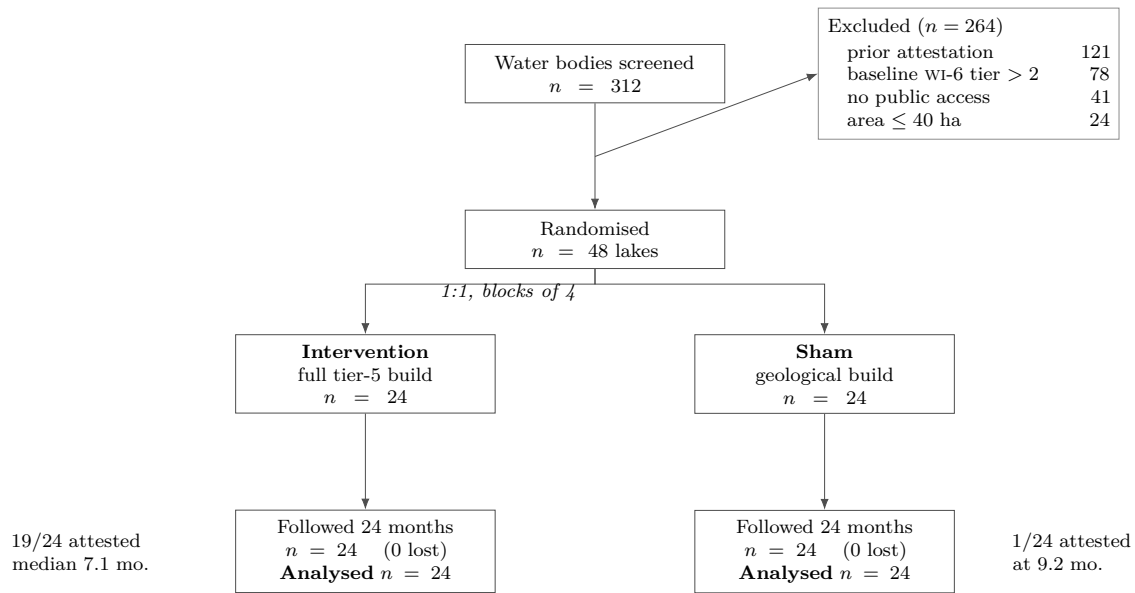


Figure 2: CONSORT flow for LACUSTRINE-1. Intervention and sham builds were matched on cost, mass, and retail footprint; they differed only in what the apparatus described.

Table 2: Baseline characteristics of the 48 enrolled water bodies. No body had an attested sighting before installation, by construction.

	Intervention ($n = 24$)	Sham ($n = 24$)
Surface area, ha, median (IQR)	91 (58–142)	88 (61–150)
Shoreline, km, mean (SD)	7.4 (3.1)	7.1 (2.9)
Visitor-days per year, thousands	18.2 (9.6)	17.9 (10.1)
Baseline WI-6 tier, median	1	1
Mean summer turbidity, NTU	4.6 (2.2)	4.4 (2.0)
Distance to trunk road, km, mean	5.9 (3.3)	6.2 (3.5)
Build cost, £thousand, mean	61.4	61.0

Sham ($n = 24$). Identical civil works, identical spend (mean difference £412 per site), identical visual mass, identical retail point—all of it concerning the site’s surficial geology. The same lectern, the same bench, the same cast object, the same till, the same soft toy. The toy is a boulder.

The sham arm is the trial. It holds footfall, dwell time, spend, and the signal that somebody has decided this place is worth stopping at, and it varies only what the visitor has been told to look for.

Outcome. Time from installation to first independently attested sighting, ascertained by a three-member panel blind to allocation, from the national archive, local-press full-text search, and a standing report line. Follow-up 24 months.

7 Results

7.1 Primary endpoint

Within 24 months, 19 of 24 intervention lakes and 1 of 24 sham lakes had produced an independently attested animal. The risk ratio is 19.0 (95% CI 2.8 to 130.9); the risk difference is 0.75 (95% CI 0.57 to 0.93). Median time to attestation in the intervention arm was 7.1

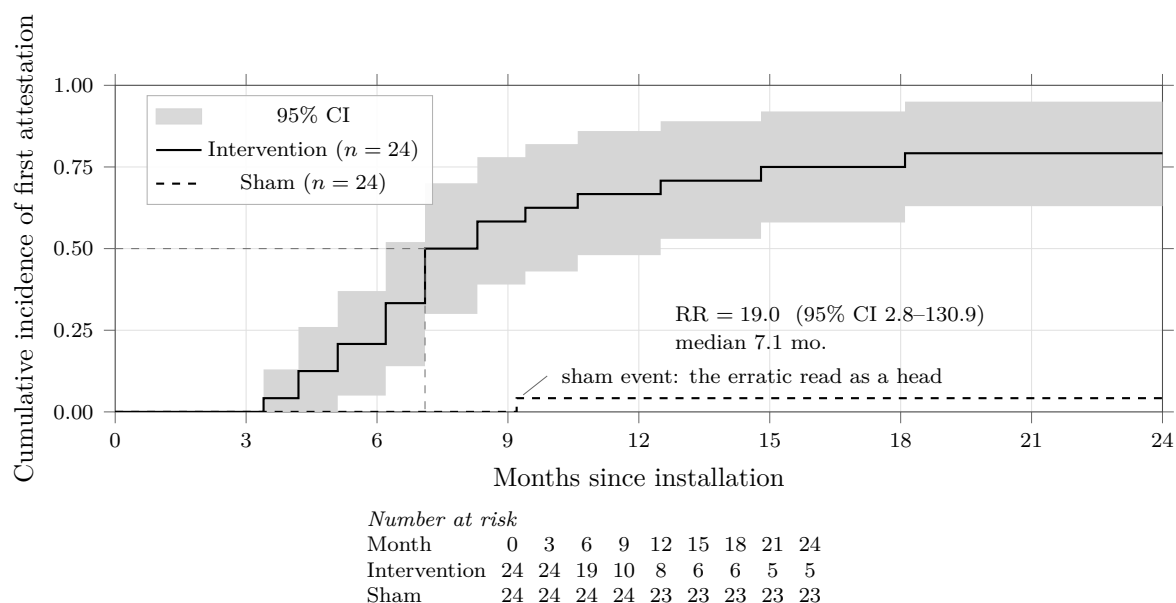


Figure 3: Cumulative incidence of first independent attestation by arm.

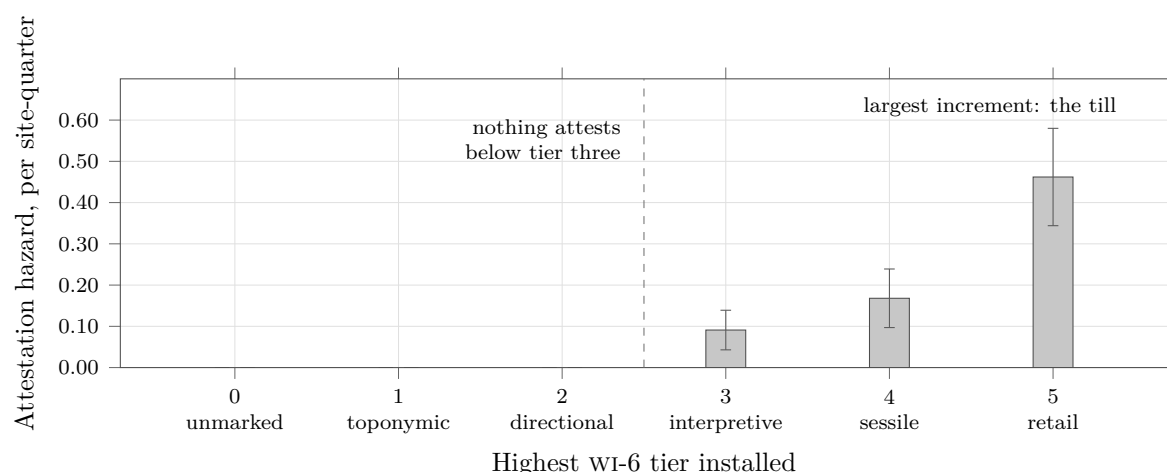


Figure 4: Attestation hazard by interpretive tier, staged-build subgroup.

months, in close agreement with the lag kernel fitted independently on the retrospective cohort (§4).

The single sham event requires description rather than adjustment. At one site the cast geological object—a glacial erratic, rendered at two-thirds scale—was described in the regional press as resembling a head, and reports of an animal followed within five weeks. It is retained in the numerator and in the denominator. It is not treated as a protocol deviation, and no analysis in this paper excludes it.

7.2 Dose–response

A pre-planned secondary analysis staged the build at 12 intervention sites, adding one tier per quarter. The attestation hazard rises monotonically with interpretive stock (Figure 4). No site attested at tier 0, 1, or 2. The first attestations follow the lectern. The largest single increment is the till.

Nothing attests below tier three.

7.3 Morphological fidelity

Of the 19 intervention attestations, 17 described a limbless form with a dorsal crest. Reported length was 4.6 m (SD 1.4), against 5.0 m depicted. No attestation described a limbed animal. The reports match the lectern to within the resolution of a distant sighting on open water.

8 Discussion

The register records attestations. Attestations respond, with a lag of one season, to the installation of objects that tell a visitor what to look for. They do not respond to objects of identical cost, mass, and visibility that tell a visitor something else. They do not respond in ducks. And the lake's own contribution to the process, which the field has estimated for twenty years, is not a quantity the model can hold.

We therefore propose that a cryptid population be understood not as a set of animals that a water body contains but as an object that a water body has been equipped to produce, and that its unit be the attestation, its instrument the WI-6, and its custodian the register. This is a weaker claim than it appears. It does not say the lakes are empty. It says that emptiness and occupation are, on the present evidence, the same fitted value.

There is an administrative consequence, and the Committee has taken it. Nineteen animals entered the register during this trial. They were entered under the standard, by the standard's own criteria, and they cannot be struck out for having been caused by the Committee, because the standard contains no such ground. They are, in the only sense the register recognises, real.

9 Limitations

Four water bodies we cannot explain. In the retrospective cohort, four sites carry attested sightings antedating every recorded item of apparatus by between 30 and 90 years. Under (2) their fitted intensity is indistinguishable from zero for the whole of that period. We have not dropped them, down-weighted them, or found a coding error in them. They are the strongest evidence against this paper, and we have no account of them.

Decommissioning failed. All intervention apparatus was removed at month 24 under a pre-specified reversal protocol. Attestation rates did not fall. At month 48 they were higher than at month 24 at 11 of 19 sites, with no apparatus in place at any of them. Voss & Halloran (2024) report the same failure at a single site and offer a hysteresis model; we do not adopt it, and we decline to model this at all. What we can say is that the intervention is not reversible by its own removal, and that we did not anticipate this.

The instrument is circular. WI-6 weights were estimated on a sample drawn from the same register the instrument is then used to analyse. We flag this rather than resolve it. An externally weighted instrument would be a better instrument and does not exist.

One jurisdiction. All sites lie within a single planning regime. The instrument in §5 is an artefact of that regime's statutory timetable and does not transfer.

10 Conclusion and Standing Directive

The apparatus precedes the animal. It precedes it by about seven months. It precedes it in the archive, it precedes it under an instrument, and it precedes it under randomisation with a sham control holding everything but the subject of the sign.

The Committee accordingly directs, under its constituting instrument: that all new interpretive apparatus at inland water bodies be entered in the register at the date of installation and not at the date of first report; that any application proposing tier-5 apparatus at an ungazetted body be accompanied by a statement of the population it is expected to produce; and that no apparatus be removed in the expectation that removal reverses attestation, because it does not.

Nineteen lakes that held nothing in 2021 hold something now. The Committee built it, recorded it, and cannot take it out.

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