



# The Database of British and Irish Hills

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- [An Dun \(399/400, 5\)](#)
- [Fiacail na Leth-choin \(560, 8A\)](#)
- [Carn Liath \(595, 8B\) and Creag an Dail Bheag](#)

### Wales

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[\(596, 8B\)](#)

- [Corrieyairack Hill \(632, 9B\)](#)
- [The Saddle \[Trig Point\] \(686, 10A\) and The Saddle \(688, 10A\)](#)
- [The Saddle West Top \(696, 10A\)](#)
- [Sgurr na Creige \(706, 10A\)](#)
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## Introduction

The Database of British and Irish Hills (DoBIH) was founded in 2001. Its twin objectives are to present the most accurate hill data available for lists that meet our criteria of notability and demand, and to provide logging facilities for baggers. The evolution of the database can be followed in a series of [articles](#) in *Marhofn* and *Relative Matters* magazine. The editorial team (in order of joining) currently comprises Graham Jackson, Chris Crocker, John Barnard, Simon Edwardes, George Gradwell, Jim Bloomer and Dave Marshall.

The database is provided in two principal formats: an Access database, from which Excel and csv versions are derived, and an online database accessible at [Hill Bagging](#). Routines are provided to facilitate transference of personal ascent records between Hill Bagging and Access. Hill Bagging does not return the fields with [absolute grid reference](#), latitude/longitude (except by reading off the map) or [revision date](#), but gives additional fields for Catchment and Watershed, and links to photographs on the [hill summits](#) website. Hill Bagging is continuously updated with changes to lists and data and is therefore the most up to date. New versions of the downloadable database are issued at a frequency of two or three per year. Significant changes to hill lists (except for Tumps below 500m and subs) between releases are communicated via [newsflashes](#) on this site. All classification changes and significant relocations are announced on [Hill Bagging](#) when they enter the database.

We place no restrictions on use of the data by third parties and encourage authors of other websites and applications to do so. We just ask users to observe the terms of the [Creative Commons licence](#).

## Discrepancies

Many hills occur in more than one list, which may give different data in the original sources. Where a list author has chosen a different location for the summit, we record this in the database. In cases where the locations could be regarded as separate summits we list the hills separately. This can be a subjective decision; we hope the majority of users will agree with our choices. Occasionally a list author's classification is at odds with our data; these are tabulated in a [list of discrepancies](#).

If you find any errors or wish to query data, please email the authors at the address on the home page of either of our websites.

## Summary of lists

The following table summarises the main lists included in the database. It excludes [subs](#), Marilyn and Hump Twin Tops and a few historic and subjective lists (Bridge, Buxton & Lewis, Yeaman, Clem, Dillon, Trail 100). More information on the individual lists is given in [Definitions](#) and [Background](#).

Some lists are subsets of other lists. For example, the Marilyns are a subset of the Humps, the Grahams are a subset of the Marilyns, and many lists are subsets of the Tumps. Some lists are not exact subsets due to [discrepancies](#) between lists.

### National lists

| Height<br><i>feet</i> <sup>1</sup> | Height<br><i>metres</i> | Drop<br><i>metres</i>          | Scotland                 | England and<br>Wales* | Ireland         |
|------------------------------------|-------------------------|--------------------------------|--------------------------|-----------------------|-----------------|
|                                    | any                     | 150+                           | Marilyn                  | Marilyn               | Marilyn         |
|                                    | any                     | 100+                           | Hump                     | Hump                  | Hump            |
|                                    | any                     | 30+                            | Tump                     | Tump                  |                 |
|                                    | 600+                    | 30+                            | Simm                     | Simm                  | Simm            |
|                                    | 500-599.9               | 30+                            | Dodd                     | Dodd                  | Dodd            |
| 3000+                              | 914.4+                  | undefined                      | Munro, Munro<br>Top      | Furth                 | Furth           |
| 3000+                              | 914.4+                  | 30+                            | Murdo <sup>2</sup>       |                       |                 |
| 2500-2999                          | 762.0-914.3             | 152.4+<br>(500ft) <sup>3</sup> | Corbett                  |                       |                 |
| 2500-2999                          | 762.0-914.3             | 30+                            | Corbett Top <sup>2</sup> |                       |                 |
|                                    | 600-761.9 <sup>4</sup>  | 150+                           | Graham                   |                       |                 |
|                                    | 600-761.9 <sup>4</sup>  | 30+                            | Graham Top <sup>2</sup>  |                       |                 |
| 2000+                              | 609.6+                  | 30+                            |                          | Hewitt                | Hewitt          |
| 2000+                              | 609.6+                  | 15+                            |                          | Nuttall               |                 |
|                                    | 600+                    | 15+                            |                          |                       | Vandeleur-Lynam |
|                                    | 500-609.5               | 30+                            | Donald Dewey             | Dewey                 |                 |
|                                    | 500-599.9 <sup>5</sup>  | 30+                            | Highland Five            |                       |                 |
|                                    | 500+                    | 30+                            |                          |                       | Arderin         |
|                                    | 400-499.9               | 30+                            |                          |                       | Carn            |
|                                    | 100-399.9               | 100+                           |                          |                       | Binnion         |
|                                    | n/a                     | n/a                            | County Tops <sup>6</sup> |                       |                 |
|                                    | n/a                     | see <sup>7</sup>               | SIB                      |                       |                 |
|                                    |                         |                                | SIB <sup>8</sup>         |                       |                 |

<sup>1</sup> For lists where the current or original definition is expressed in feet

<sup>2</sup> These categories have been superseded by the Simms

<sup>3</sup> 1691 Kirriereoch Hill is the only hill within this height range with a drop between 150 and 152.4m. It was deleted from the Corbetts in 1984 and added to the Marilyns in 2015

<sup>4</sup> Lower height limit reduced from 609.6m (2000ft) in December 2022

<sup>5</sup> Upper height limit reduced from 609.5m (below 2000ft) in December 2022

<sup>6</sup> See [County Tops](#) for subsets

<sup>7</sup> Islands having at least 30m drop or 30 hectares area excluding sea stacks; see [SIBs](#)

<sup>8</sup> Not included in the database

\* The **Isle of Man** is included in the British Marilyns, Humps, Dodds, Tumps, Deweys and SIBs, but not in the British Simms, Hewitts or Nuttalls. Some older lists of 2000ft hills in England and Wales, including Bridge and Buxton & Lewis, include Snaefell on the Isle of Man.

The **Channel Islands** are included in the British Humps, Tumps and SIBs.

### Regional lists

| Height<br><i>feet</i> | Height<br><i>metres</i> | Drop<br><i>metres</i>       | Region           | List       |
|-----------------------|-------------------------|-----------------------------|------------------|------------|
| 2000+                 | 609.6+                  | 30.48+ (100ft) <sup>1</sup> | Southern Uplands | Donald     |
| 2000+                 | 609.6+                  | 30.48+ (100ft) <sup>2</sup> | Southern Uplands | Donald Top |

|                    |                     |           |               |                          |
|--------------------|---------------------|-----------|---------------|--------------------------|
| 1000+ <sup>3</sup> | 304.8+ <sup>3</sup> | undefined | Lake District | Wainwright               |
| undefined          | undefined           | undefined | Lake District | Wainwright Outlying Fell |
| 1000+              | 304.8+              | undefined | Lake District | Birkett                  |
|                    | 300+ <sup>3</sup>   | undefined | Lake District | Synge                    |
| undefined          | undefined           | undefined | Lake District | Fellranger               |

<sup>1</sup> As for Donald Tops but more than 17 units from the main top of the 'Hill' to which it belongs, where a unit is either one-twelfth of a mile measured along the connecting ridge or one 50-foot contour between the lower Top and its connecting col

<sup>2</sup> Plus peaks of sufficient topographical merit between 50ft and 100ft

<sup>3</sup> Except Castle Crag

## Background to the lists

The first list of British hills to gain popularity, of Scottish mountains over 3000 feet high, was compiled by Sir Hugh Munro in 1891. The Munros were joined by the Corbetts and Donalds and became well known thanks to their publication in *Munro's Tables*. It took a surprisingly long time for a definitive list of Scottish hills in the range 2000-2500 feet to appear, but in the 1997 edition of *Munro's Tables* the SMC adopted the list of Grahams that Alan Dawson first published in 1992. Of Dawson's other Scottish lists, the Murdos (1995) and the New Donalds (1995) were motivated by a desire to bring objectivity to the classification of Munro Tops and Donalds. Breaking new ground was *Corbett Tops and Corbetteers* (1999). Corbett Tops include subsidiary summits of Munros and Corbetts within the Corbett height range. This was followed by *Graham Tops and Grahamists* (2004). This last list subsumes the New Donalds. The last four publications, and three similar ones listing the Hewitts of England, Wales and Ireland, were published by TACit Press but are now out of print. In June 2010 Dawson created the Simms (**S**ix-hundred **M**etre **M**ountains; originally called Sims) by combining the Murdos, Corbett Tops, Graham Tops and Hewitts and lowering the height threshold to 600m. The [Simm Hall of Fame](#) requires the ascent of 2000 Simms.

Completions of the Munros, Tops, Furths, Corbetts, Grahams and Donalds are recorded by the [SMC](#). Dave Hewitt gives details of [Corbett completions](#) up to July 2018. Completions of Grahams and Simms are recorded by Alan Dawson in the [Relative Hills of Britain](#) website.

Outside Scotland, the Hewitts (**H**ills in **E**ngland, **W**ales and **I**reland over **T**wo **T**housand feet high), together with the [Nuttalls](#) in England and Wales, are the most accurate and up-to-date of a succession of publications listing the 2000-foot summits. In Ireland, a popular list has been [The Mountains of Ireland](#) by Paddy Dillon, published in 1993. A listing of Irish hills equivalent to the Nuttalls was superseded in 1997 by a metric equivalent, the [Vandeleur-Lynams](#). Some of the earlier lists are of historical interest but for practical use most people will have little reason to look beyond those mentioned above. However we acceded to requests to include Buxton & Lewis (1986) and Bridge (1973). The last two lists are defined by the original publication and are not subject to revision. The lists of Elmslie, Simpson and Moss have been republished online by [Moss](#).

Completions of the English, Welsh and Irish 2000-foot hills are recognised by the [Long Distance Walkers Association](#) (LDWA). It might be thought unreasonable to treat England and Wales as one country, but only [The Nuttalls](#) will record completions in a single country.

The first publication to list the 500m tops of England and Wales was Michael Dewey's [Mountain Tables](#) in 1995. They effectively extend the Hewitts down to 500m. The Deweys were extended to Ireland by Michael Dewey and Myrddyn Phillips in 2000, and to the Scottish Lowlands (Donald Deweys) by David Purchase in 2001. Completions of the Deweys and Donald Deweys are recorded by the LDWA. Equivalent hills in the Scottish Highlands did not have a separate identity before publication in the DoBIH in 2011, but a list was compiled by Rob Woodall using data from Tony Payne, Clem Clements, John Kirk and others and uploaded to the (now defunct) rhb forum in 2003 and updated in 2006. The data were comprehensively revised by the DoBIH team and with the agreement of Rob Woodall named the Highland Fives. In 2014 Jim Bloomer and Alan Dawson proposed in a Marhofn article a pan-GB metric equivalent called the Dodds (**D**onald **D**eweys, **D**eweys and **S**cotland) which reduced the upper height limit to just below 600 metres. The Dodds originally excluded the Isle of Man and could be regarded as a downward extension of the Simms. The Dodds entered the DoBIH in December 2017 and were extended to Ireland in September 2020. The list is maintained by the DoBIH team. Entry to the DoddHoF requires the ascent of 500 Dodds.

In Ireland, [MountainViews](#) has built on data from other sources to create the Arderins for hills over 500m high and the Carns for hills in the 400–500m range. In 2013 it published [A Guide to Ireland's Mountain Summits: The Vandeleur-Lynams & The Arderins](#), reprinted with revisions in 2015.

Eric Yeaman's *Handbook of the Scottish Hills*, published in 1989, set a milestone by doing away with a minimum height. The criterion for inclusion was "an eminence which has an ascent of 100m all round, or, failing that, is at least 5km (walking distance) from any higher point on neighbouring hills". The list has not been maintained but was the forerunner of the Humps, in which the criterion was simplified to 100m of drop. The Yeamans were extended to England, Wales and the Isle of Man by E D "Clem" Clements in 1993. Originally called Yeamans of England & Wales or Yeomans, they were renamed The Clems after Clements' death.

The Marilyns was the first list with a criterion solely on drop. Published by Alan Dawson in [The Relative Hills of Britain](#) in 1992, the Marilyns have acquired a large following among hill baggers. Marilynists' interests are covered by a [website](#) and the forum [Pedantic Publications](#) that replaced the Yahoo rhb group in December 2020. Due to the inaccessibility of the St Kilda sea stacs it took 22 years for the list to be completed, a feat first achieved by Rob Woodall and Eddie Dealtry on 13 October 2014. The [Marilyn Hall of Fame](#) is open to those who have climbed 600 Marilyns. The Marilyns were extended to Ireland by Clem Clements in *The Hewitts and Marilyns of Ireland* in 1997.

Marilyns have a drop (minimum descent before ascending to higher ground; also known as relative height or [prominence](#)) of at least 150m. They were supplemented in 2007 with the Humps (**H**undred **M**etre **P**rominence) which reduces the minimum drop to 100m. The list was compiled by Mark Jackson from a large number of sources and originally published online in [More Relative Hills of Britain](#). There are almost 3000 British Humps, including three in the Channel Islands. The Humps were extended to Ireland by Jim Bloomer in 2011.

Background to the Humps is given in [Hill Bagging](#). By analogy with the Marilyn Hall of Fame, Mark Jackson created the Humps Hall of Fame, requiring 1200 ascents of British Humps.

The Tumps (**T**hirty & **U**pward **M**etre **P**rominences) comprise all the hills of Britain with 30m or more of drop, with no minimum height. Thus it incorporates a number of other hill lists, and naturally owes its existence to many contributors over several years. The Simms and Dodds comprise the portion of the Tumps above 500 metres. The hills between 300 and 500 metres were first listed by Clem Clements and Myrddyn Phillips. Their work was made available to the rhb community in files compiled by Rob Woodall, which paved the way for a complete listing of Tumps to be released by Mark Jackson in 2009, upon finishing three years of on-and-off research into the c.8,000 hills below 300 metres. The original list was subsequently revised with the assistance of data from Myrddyn Phillips' lists of English and Welsh hills below 500 metres (the Pedwars, Fours, lower Welsh P30s and subs). The Tumps comprise over 17,000 hills and are a well established bagging objective. Andrew Tibbetts maintained and improved the list and in December 2011 released an Excel file containing the 10,000-odd hills not present in the DoBIH. This file became the P30 Appendix to the DoBIH in May 2013. It went through two revisions before being brought into the DoBIH in version 14. Improvements in online mapping and the availability of LIDAR data have led to many changes to the list in recent years. These are continuing as LIDAR coverage increases.

Walkers who have climbed 2,000 Tumps are eligible to join the Tump Hall of Fame. [The Tump Forum](#) is on Google Groups. The Tump Forum and TumpHoF are maintained by Adrian Rayner. Suggestions for new Tumps can be made to the DoBIH editors or on The Tump Forum.

Such is the popularity of the English Lake District that a number of lists have emerged specifically for that region. The best known is the Wainwrights, which was almost certainly not conceived as a list. The Birketts is a more recent listing of Lake District Hills. The Wainwright Outlying Fells and the Birketts were each published as a set of walks rather than a list, but as with the Wainwrights, a tradition of climbing them has developed. The Synges is a longer list of Lakeland hills. The most recent list is the Fellrangers, which resemble an updated Wainwright. The LDWA recognises completions of all these lists except the Synges.

The County Tops of Scotland were first listed by Naismith in 1891, and of England and Wales by Moss in 1951. Other listings followed from 1973 onwards, including coverage of Ireland in 1985. In Britain, the frequent local government reorganisations have caused lists based on administrative boundaries to become quickly out of date, and some walkers may prefer to ascend the highest points of the historic counties. Simon Edwardes overhauled the county tops for the [Hill Bagging](#) website and produced lists based on both historic and administrative boundaries. These lists are given in the database and are the most up-to-date available.

A recent phenomenon has been the growing interest in bagging island summits. *The Scottish Islands* by Hamish Haswell-Smith includes the larger islands (minimum area 40ha) and has been used by some walkers to provide bagging objectives. This is a useful book but is targeted at yachtsmen and tourists. The criteria for island status are unintuitive from a hillwalker's perspective (it must be reachable only by boat at all tide states, so Skye is excluded by virtue of the bridge). Rick Livingstone produced an online table of Scottish islands using a 15ha criterion that is more attuned to hillwalkers



but it seems to be less well known. In October 2014 Alan Holmes published on the rhb group the most comprehensive island list to date, which he named The Significant Islands of Britain. It was created specifically for hillwalkers, uses both area and drop criteria, and covered the whole of Britain (later extended to the Isle of Man, Channel Islands and Ireland). There are various subsets; the main list, comprising the SIBs of Britain, is given in the DoBIH.

The categorisation of mountains worldwide by prominence is well established. For information visit the [Topographic Prominence](#) and [Europeaklist](#) websites and their associated discussion groups. An early US led initiative was to list hills worldwide with a drop of at least 2000ft (609.6m). Although a register of baggers' totals is maintained by Andy Martin, the prominence criterion has been largely superseded by 600m in countries outside the US, although a few lists have used 500m. The 600m prominence hills are sometimes called the Majors. In Britain and Ireland, lists with 600m ("The Majors") and 500m drop are offered on [Hill Bagging](#). Internationally, 1500m drop has become the accepted standard for the most prominent mountains and the category is known as the [Ultras](#). A more recent category, the [Ribus](#), specifies a minimum drop of 1000m. It originated with listings in Indonesia and Malaysia, *ribu* meaning a thousand in the Indonesian language, but is capturing interest in other countries.

In v11.2 we added the [Trail 100](#) to align with the Hill Bagging website, which had added the list prior to merging with the DoBIH. The original list of 100 hills was published in *Trail* magazine in 2007 and had become popularised by becoming the objective of the WaterAid Trail 100 charity challenge. The list includes one Irish hill, Slieve Donard in the Mourne. The charity event was not repeated after 2008 and 2009, but the list continued to be referenced in *Trail*. The list was revised in January 2020. [Summary of changes](#)

## Revisions to the lists

Most current lists based on height or prominence criteria have been subject to regular revision. Changes can be broadly classified into the following:

- Promotions
- Deletions
- Replacements
- Relocations
- Data changes

The last category comprises changes to primary hill data that would not affect a bagger's ascent records, including small changes in summit location. Such changes are not explicitly mentioned in the database but a change in height, 6-figure GR, drop or col location will trigger a new revision date.

A replacement creates a new hill in the database whereas a relocation does not. With the exception of minor Tumps, most moves of more than 400m will trigger a replacement, as will lesser moves if the summit has a clearly separate identity, or if the former summit is retained as a member of a different list (e.g. the former Marilyn summit of Wansfell is a Birkett).

Our definition of replacement is more liberal than that adopted by the RHB update sheets (in "Hill changes") or the Appendix to the Humps e-book (which requires 30m of drop between the original summit and the replacement). This is necessary in order that a change in location does not invalidate baggers' records, including walkers' logs on the Hill Bagging site. For example, Botley Hill, which moved by 1km, clearly justified a new record as many baggers had to revisit the hill following the change.

In doubtful cases we will create a new hill if there is a fair chance that a bagger of the former summit would not have visited the new one, recognising that most baggers will make an attempt to locate the highest point when there are plausible alternatives in the vicinity.

For minor Tumps (hills <500m that do not belong to other lists) we have taken a more flexible approach due to the large number of major relocations we were finding in data reviews and are continuing to find with the publication of LIDAR data. Particularly when there are few logs on Hill Bagging, we often elect not to create a new hill, but all significant relocations are listed in the summaries of changes published on the home page of Hill Bagging and advertised on [The Tump Forum](#).

A relocation is a significant move (at least 100m for mention on the home page of Hill Bagging) that is worthy of mention but does not merit a replacement. Relocations are given in the Change Registers along with promotions, deletions and replacements. Currently all Tump moves of 200m or more are listed in the [Tumps Change Register](#) which is produced at each revision of the downloadable

database.

## Change registers

Chronological records of changes (excluding data changes) are given for the following lists.

|          |   |
|----------|---|
| Munros   | <a href="#">The Munros 1891-2021</a>  |
| Corbetts | <a href="#">The Corbetts 1953-2016</a>  |
| Donalds  | <a href="#">The Donalds 1953-2015</a>   |
| Grahams  | <a href="#">Changes to the Grahams</a>  |
| Marilyns | <a href="#">Changes to the Marilynns</a>  |
| Humps    | <a href="#">Changes to the Humps</a>  |
| Simms    | <a href="#">Changes to the Simms, Murdos, Corbett Tops, Graham Tops and Hewitts</a> |
| Dodds    | <a href="#">Changes to the Dodds</a>  |
| Nuttalls | <a href="#">Changes to the Nuttalls</a>   |
| Deweys   | <a href="#">Changes to the Deweys</a>   |
| Tumps    | <a href="#">Changes to the Tumps</a>  |
| Yeamans  | <a href="#">Changes to the Yeamans</a>  |
| Clems    | <a href="#">Changes to the Clems</a>  |

A change register for the Submarilyns up to 2016 is given on the [Relative Hills of Britain](#) site. 5337 Overmoor and 5344 Barns Cliff End have since become Submarilyns, while 2271 Mynydd Bwlch-y-Groes has been deleted.

## Change Control Database

Changes to data in the DoBIH, other than updates from the GPS database, are made through a publicly viewable [Change Control Database](#). Only the database editors can raise change requests, but users may propose changes by email. Changes go through the following stages:

1. Change Request raised. The status is shown as *Requested*.
2. A consultation period during which other editors will check the data and agree the change or make amendments. In the latter case the status will change to *Revised*. An editor who disputes the change or has reservations (who may be the author) can put it *On hold*. A change request can be cancelled by the original author. The number of editors who have agreed the change following the latest revision is shown after (*Agree=*) on the summary page.
3. When two editors have agreed a change, the colour of (*Agree=*) changes from red to green. At this point the change becomes eligible for application, but the consultation period will remain open until all the editors have had sufficient time to review the change.
4. The status becomes *Applied*. The changes are applied to [Hill Bagging](#) immediately and to the DoBIH in the next release. Any further amendment will require a new change request.

In the past the system was used to record "near misses", mostly possible Tumps suggested by database users. The editor would raise a Change Request and reject it. The topographical surface analyses for the whole of Britain periodically carried out by Joe Nuttall from March 2020 onwards using LIDAR and digital mapping datasets have removed the need for this practice. The outcome of investigations of marginal hills by the DoBIH editors is recorded in a master file created from the surface analysis output.

## GPS Database

[GPS data](#) submitted to the GPS database administrator or logged on Hill Bagging are recorded in an online [GPS database](#) that complements the Change Control Database. Submissions postdating the database's introduction in March 2015 have a positive Entry no. in the GPS Data sheet. Earlier submissions imported from the previous offline database can be identified by a negative Entry number. For those entries the corresponding Feature/Observations/Survey entries are taken from the DoBIH as of March 2015, but a full record of the original submissions is held by the database administrator.

All submissions are validated by comparing with existing records and/or checking on maps, as appropriate. Approved entries are fed into Hill Bagging at frequent intervals. Where a hill has existing data, the new measurement may replace the original (usually when a survey or LIDAR analysis has revealed the new location to be higher), otherwise the updated grid reference will be the average of all valid measurements. The xcoord, ycoord, latitude, longitude, GridRefXY fields and derived map

links are recalculated from the new GR.

Summits and cols accurately measured by differential GPS instruments are recorded similarly, but a linked Change Request is raised to add the heights and col grid reference. This method is also used when adding a 10-figure grid reference from LIDAR and an associated decimal height. When the forms are linked in this way, the entries in the GPS Update fields are shown in the Change Request.

## Definitions

### Marilyns

British and Irish hills of any height with a drop of at least 150 metres on all sides. The geographical area includes the Isle of Man and the islands of St Kilda.

A **Marilyn Twin Top** is a summit of equal height to another Marilyn where the drop between the two is less than 150m and at least 30m. The only example is 21168 Knockalla Mountain NE Top in Ireland.

Cruachan Dearg, Meall nan Damh, Sidhean a' Choin Bhain (formerly twin Grahams), Cnoc Coir a' Phuill, [Sgurr a' Bhac Chaolais](#), Middleton Hill, An Stuc, [Carn Liath](#), [Saugh Hill](#), and for a few years Stob Coire a' Chairn, were formerly twin Marilyns.

Many hills have alternative summit locations of apparently equal height that fail to qualify as Twin Tops. Examples of such hills feature in the RHB update sheets. For historical reasons a few of these summits have separate entries in the database. For other hills, alternative high points are noted in the Observations or the Comments field. It is left to the walker to decide whether all such points should be visited; on some hills there are many candidates for the highest point and the exercise could degenerate into pedantry.

### Humps

British and Irish Hills of any height with a drop of at least 100 metres or more on all sides. The name Hump stands for **H**undred **M**etre **P**rominence. As all Marilyns qualify as Humps, the classification code Hu is only used for non-Marilyns; however all Humps are returned in searches. The geographical area was extended to the Channel Islands in November 2011.

A **Twin Hump** is defined as a summit of equal height to another Hump where the drop between the two summits is at least 30m but less than 100m.

### Tumps

British hills of any height with at least 30m of drop. The geographical area was extended to the Channel Islands in September 2014.

A **Twin Tump** is defined as a summit of equal height to another Tump separated by a distance of at least 5km where the drop between the two summits is less than 30m. There is currently one Twin Tump.

### Simms

British hills at least 600 metres high with a drop of at least 30 metres on all sides. The list was created by its author to replace the Murdos, Corbett Tops, Graham Tops and Hewitts. We have extended the Simms to the Isle of Man (one summit) and Ireland.

### Dodds

Hills in Scotland, England, Wales, the Isle of Man and Ireland between 500m and 599.9m high with a drop of at least 30 metres on all sides.

### Munros

Scottish hills at least 3000 feet in height regarded by the SMC as distinct and separate mountains, based on a list originally published in 1891. Subsidiary summits meeting the height criterion are designated **Munro Tops**; note however that the 'Tops' as defined in *Munro's Tables* includes the Munros. Summits equivalent to the Munros and Tops in England, Wales and Ireland on the SMC's list are known as **Furths**.

### Murdos

Scottish hills at least 3000 feet in height with a drop of at least 30 metres on all sides. All Murdos are Munros or Munro Tops but some Munro Tops fail to qualify as Murdos. The list now has "historic" status.

### Corbetts

Scottish hills between 2500 and 2999 feet high with a drop of at least 500 feet (152.4m) on all sides.

### Corbett Tops



Scottish hills between 2500 and 2999 feet high with a drop of at least 30 metres on all sides. The TACit publication divides them into three sub-categories: Corbetts, Corbett Tops of Munros, and Corbett Tops of Corbetts. The list now has "historic" status.

### Grahams

Scottish hills at least 600m high and below 762m (2500 feet) with a drop of at least 150 metres on all sides. The lower limit was reduced from 2000 feet (609.6m) in November 2022.

### Graham Tops

Scottish hills at least 600m high and below 762m (2500 feet) with a drop of at least 30 metres on all sides. The lower limit was reduced from 2000 feet (609.6m) in December 2022. The TACit publication divides them into five sub-categories: Grahams, Graham Tops of Munros, Graham Tops of Corbetts, Graham Tops of Grahams, and Graham Tops of Hewitts (one hill). Another table lists hills between 600 and 609.6m high. The list now has equivalent status to the "historic" lists in the database but is subject to changes from surveying.

### Donalds

Hills in the Scottish Lowlands at least 2000 feet high. 'Tops' are all elevations with a drop of at least 100 feet (30.48m) on all sides and elevations of sufficient topographical merit with a drop of between 50 and 100 feet. Certain of these are designated 'Hills' according to a formula based on both distance and drop: see the footnote to the second table in [Summary of lists](#).

A related list is Dawson's *New Donalds*, not recognised in the database but searchable on Hill Bagging, in which the qualifying criterion is simplified to 30 metres of drop. The *New Donalds* is a subset of the Graham Tops and Simms. Anyone who has completed the Donalds and Donald Tops will have visited all the New Donalds.

### Hewitts

Hills in England, Wales and Ireland at least 2000 feet high with a drop of at least 30 metres on all sides. Although subsumed into the Simms, the list has been retained by its author.

### Nuttalls

Hills in England and Wales at least 2000 feet high with a drop of at least 15 metres on all sides, as published in [The Mountains of England and Wales](#). The list includes 128 summits that do not qualify as Hewitts. Particularly notable is Pillar Rock as its ascent by the easiest route is a Moderate rock climb or Grade 3 scramble. Many of these additional summits, including Pillar Rock, also feature in Bridge's and Buxton & Lewis's lists. Completions without Pillar Rock are accepted by the LDWA and the Nuttalls, though this is noted in the record.

### Vandeleur-Lynams

Hills in Ireland at least 600 metres high with a drop of at least 15 metres on all sides. In 1952 Joss Lynam produced a list of 2000ft summits with 50ft drop with assistance from Rev C R P Vandeleur. Lynam updated a version of this list and published it in a reprint of "Mountaineering in Ireland" by Claude Wall printed in 1976. The metric equivalent was published in 1997. Lynam was actively involved with the list until 2002, thereafter assisting [MountainViews](#) with subsequent revisions until his death in 2011.

### Dillons

Hills in Ireland at least 2000 feet high published in [The Mountains of Ireland](#). There is no prominence criterion. 14 Dillons are not Hewitts; 13 have drop <30m, while 20213 Corcog has a 609m spot height (the old 1:10560 map shows 2012ft which converts to 610.6m on the new datum). 10 Hewitts are not Dillons. In addition, the Dillons and Hewitts give different summits (20057 vs. 20571) for Tievummera.

### Deweys

Hills in England, Wales and the Isle of Man at least 500m high and below 609.6m with a drop of at least 30m on all sides. The **Donald Deweys** is an equivalent list in the Scottish Lowlands. The **Highland Fives** in the Scottish Highlands and Islands originally had the same criteria, but in December 2022 the upper height was reduced to 600m in tandem with the redefinition of Graham Tops.

The most awkward Dewey is Great Links Tor, which even with the aid of a ladder to gain the crag presents difficulties on wet rock. A completion without Great Links Tor is accepted by the LDWA, though this is noted.

### Arderins

Hills in Ireland at least 500 metres high with a drop of at least 30m on all sides. The list was compiled in 2002 by Simon Stewart in [MountainViews](#) and named in 2009. The name comes from the

527m hill which is the County Top for both Laois and Offaly and means, from the Irish, "Height of Ireland".

### Carns

Hills in Ireland between 400 and 499.9m high with a drop of at least 30m on all sides as defined by [MountainViews](#), based on a list originally supplied to the Mountaineering Council of Ireland by Myrddyn Phillips. The name comes from Carn Hill, Cnoc an Chairn, "hill of the cairn" in the Sperrins. We have overhauled the data using current and old maps and produced an updated listing identified with the classification code 4. The MountainViews list can be obtained in searches via the code Ca. Differences between the two lists have been [tabulated](#).

### Binnions

Hills in Ireland with height below 400m and a drop of at least 100m on all sides. The list is a subset of the Humps apart from one hill; see [discrepancies](#).

### Wainwrights

The 214 hills listed in volumes 1-7 of Wainwright's *A Pictorial Guide to the Lakeland Fells*.

### Wainwright Outlying Fells

Hills listed in *The Outlying Fells of Lakeland*. A previously published source of data is *New Combined Indexes to A. Wainwright's Pictorial Guides*, John M Turner, *Second Edition* (1984), Lingdales Press. This list has many inaccuracies. Not least, it is short of two summits explicitly mentioned in Wainwright's book (Caermote Hill, for which the author gives the location of St John's Hill, and the southern summit of Newton Fell) and it also omits the 12 nameless summits.

For a good many hills the summit location is not the highest ground in the vicinity. This is often due to Wainwright's preference for a recognisable feature such as a cairn (which may have disappeared). It is not always straightforward to identify such locations on the map, but most are now resolved following site visits.

The list at the back of Wainwright's book contains 110 named fells and summits. Close inspection shows seven of them to refer to other hills in the list, while Newton Fell has two summits. Thus:

- Cartmel Fell is the same as Ravens Barrow (page 42)
- Hollow Moor is the summit of Green Quarter Fell (page 14)
- Hooker Crag is the summit of Muncaster fell (page 186)
- Newton Fell includes Newton Fell (North) and Newton Fell (South) (page 53)
- Potter Fell is the name given to the hill whose summits are Brunt Knotts and Ulgraves (page 8)
- Lord's Seat is the summit of Whitbarrow (page 36)
- Williamson's Monument is the same as High Knott (page 18)
- Woodland Fell is the name of the moor of which Yew Bank and Wool Knott are high points (page 102).

The addition of the 12 nameless summits brings the total number of Wainwright Outlying Fells to 116, 14 more than in Turner's list.

### Birketts

Lake District hills over 1,000ft listed in Bill Birkett's [Complete Lakeland Fells](#).

### Synges

Lake District hills over 1,000ft published in Tim Synges's *The Lakeland Summits* (1995, out of print). The book aims to list every significant summit over 300 metres in height within the National Park, including the 214 hills in Wainwright's Pictorial Guides. Distinctions are made between summits above or below 600 metres, between mountains (drop at least 30m) and tops, and between Wainwrights and non-Wainwrights.

### Fellrangers

Lake District hills included in Mark Richards' [Fellranger](#) walking series, a set of eight volumes inspired by the Wainwright guides. The series is being revised and retitled over a period of 18 months. Three hills were added to the original list in 2020 following the extension of the Lake District National Park.

### Yeamans

Scottish hills with a drop of 100m, or, failing that, at least 5km (walking distance) from any higher point. The list is not maintained and has "historic" status.

### Clems

Hills in England, Wales and the Isle of Man with a drop of 100m, or, failing that, at least 5km (walking distance) from any higher point. The list is not maintained and has "historic" status.

## County Tops

The highest point within (or sometimes on) the boundary of each county.

County boundaries change over time. There are different county lists, covering the traditional historic counties and the more recent mixtures of administrative areas.

We provide three separate lists of county tops that we believe are the most commonly used in the pursuit of county top bagging:

- Historic County tops — traditional list of counties from which people usually take their local cultural identity. In the UK they were never abolished, they just ceased to have administrative function. In the Republic of Ireland, most of the original counties are still real and important.
- Administrative County tops — incorporating the redrawn administrative boundaries and introduction of Metropolitan Counties in the mid 1970s. These began to be abolished in the 1990s.
- Current County and Unitary Authority tops — list of Counties, Metropolitan Districts and Unitary Authorities that came into existence in the 1990s, and are still changing. Included are the 11 local government districts of Northern Ireland, together with four City Councils in the Republic of Ireland and three new counties that emerged from the historic 'Dublin'.

For completeness, we have also provided a list of London Borough tops. In terms of administrative tier, these are at the same level as Metropolitan Districts.

Twin tops are listed for some County Tops.

For further information on British county history, see [Hill Bagging](#).

## SIBs

The **S**ignificant **I**slands of **B**ritain and **I**reland are defined by their author as "naturally occurring land, which at MHWS is shown on available OS mapping to be completely surrounded by water, with either an area of at least 30 hectares within the MHWS contour line or an 'easily accessed' summit prominence of at least 30 metres above MSL, all man-made links and structures being discounted". 'Easily accessed' summits are defined as those that can be comfortably ascended by walking, involving nothing more challenging than easy grade 1 scrambling. Sea stacks and other steep sided islands are therefore discounted.

The list was researched by Alan Holmes, who made it available to members of the former rhb forum on 30 October 2014. Originally the geographical coverage was confined to Britain. Version 10, released in September 2018, extended coverage to the Isle of Man, the Channel Islands, and Ireland. The DoBIH does not offer the Irish SIBs. An independent list of Irish islands is offered by [MountainViews](#).

The source file, periodically updated and circulated to members of the Relative Hills Society, includes a further category of SQUIB, which stands for **S**mall **Q**uirky **I**sland of the **B**ritish isles. The DoBIH does not offer the SQUIBs.

## Deleted Tops

These are hills that have been removed from a list. In the past the most common cause was remapping, although many Munro Tops were deleted on subjective grounds. Since 2006, many deletions have resulted from surveys by differential GPS or optical levelling. Most recent deletions, particularly of lower Tumps, have been triggered by analysis of LIDAR data.

All deleted tops are present in the database, but only deletions in the SMC lists, the Grahams which have been adopted by the SMC but are not authored by them, and deleted Nuttalls are identified by a classification code. Deletions in these categories may be mentioned in the Comments field but the [Change Registers](#) are the main record.

The deletion categories are:

- Deleted Munro Tops (xMT). Includes the deleted Munros, Beinn an Lochain, Sgurr nan Ceannaichean and Beinn a' Chlaidheimh.
- Deleted Corbetts (xC). Includes Beinn Teallach which was promoted to Munro.
- Deleted Grahams (xG). Five deletions plus a relocation.
- Deleted Donald Tops (xD). Includes the hills in Section 13—Appendix in the 1990 and earlier editions of *Munro's Tables*, and deleted Donalds (currently only the original location of Meikle

Millyea). Does not include the English hills in Section 12.

- Deleted Nuttalls (xN). Comprises the summits described as such by the Nuttalls. The majority are not true deletions, being candidates for the list that were rejected in advance of the publication.

All deletions at any time in a list's history are identified. Thus the xMT category includes all deletions from 1921 onwards. They include relocated hills in cases where the original location merits a separate hill number in the database.

## Subs

"Subs" are hills in certain prominence based lists falling short on drop by 10m or less. The term originated in the TACit Tables published from 1995 onwards and the principle has been adopted by other list authors. The database lists subs of Marilyns, Humps, Simms, Dodds, and 490-499m Tumps.

In the TACit booklets the "sub" categories include hills falling short on height, and there are additional categories for Subcorbetts and Subgrahams. The new definitions appeared in Marhofn in May 2006. The rationale for the change, as explained on the rhb forum, was that hills falling short on height had been subsumed into larger lists.

The statistical error associated with heights on OS maps means that some marginals have a non-negligible probability of qualifying for a list. Serious baggers who wish to legitimately claim ascent of all hills meeting the list criteria will need to climb some subs, in addition to hills falling short on height. As a rough guide, for hills whose height and drop have not been accurately surveyed and lack LIDAR data you should climb those within 3m of the qualifying height and 6m of drop; for more detailed guidance see section 4 of [Accuracy of heights from OS maps](#). It would be wrong, incidentally, to assume that hills falling short on both height and drop have an insignificant probability of qualification, as the two are correlated. Birks Fell was at one time listed with height 608m and drop 29m. The name "double sub" was once coined for such hills; the DoBIH's s4 category, for 490-499m hills with 20-29m drop, is a legacy from that period.

With the increasing availability of LIDAR data, and the growing number of hills surveyed to centimeter accuracy, the original concept of subs as "near misses" of interest by virtue of the possibility that they might qualify for the main list may soon become irrelevant. However some baggers enjoy climbing them in their own right.

## Description of fields

The headings below are approximately in the order in which the columns appear in the Excel version. There are some presentational differences between the online, Access and Excel/csv versions, but with the exceptions noted below, all data are given in all formats.

The following abbreviations are used when referring to sources:

RHB= *The Relative Hills of Britain* (including the [update sheets](#)); TACit= *TACit Tables*.

### Hill Number

A unique hill identifier to assist with revision and help users raise queries with the authors. The hill number will not be changed during the lifetime of the database unless it is unavoidable; such rare events will be well publicised. To upgrade non-Access versions, sort the old and new releases by hill number and copy and paste your personal ascent records from one to the other. The total number of British hills generally increases between releases, so paste your British and Irish records separately.

### Hill Name

The name(s) by which the hill generally appears in lists and maps. If this varies, we usually prefer the name most compatible with current OS mapping unless another name is particularly well known. Alternative names are given in square brackets. Qualifiers are enclosed in round brackets.

For some multi-topped hills e.g. Liathach and Quinag, the SMC gives both names. For Munros and Corbetts, the Name field gives the two names separated by a hyphen. This allows users to search the database on either name. For Munro Tops we only give the summit name, as the range name will appear in the Parent (SMC) field. We have followed the same convention for a few non-SMC hills where the summit has a different name from the hill, usually when the original list gives both e.g. Birnam Hill - King's Seat.

Scots Gaelic names have a space after a' when this is a contraction of "an". Thus we give Stuc a' Chroin rather than Stuc a'Chroin. The space is grammatically correct and is usually present on OS maps. Prior to version 16 we omitted the space to align with RHB, the TACit Tables and most hill names in *Munro's Tables*, but the SMC gives a space in their more recent publications and other authors are starting to do so. Searches on hill name in the Access version of the database and on Hill Bagging will work with or without a space.

To facilitate searching, accents in Gaelic and Welsh names have been removed.

Irish hill names are taken from [MountainViews](#) and Clements' TACit Tables. For British hills we try to include all names appearing in maps and lists that users are likely to search on, even if incorrect.

### Parent (SMC)

The hill number and name of the Munro or Donald to which Munro Tops and Donald Tops are linked. For Munro Tops the hierarchy is shown in *Munro's Tables*. For a few tops the parent is topographically incorrect on current mapping (i.e. not the hill linked by the highest col), e.g. the SMC parent of 527 Carn Lochan is Cairn Gorm rather than Ben Macdui, the parent of 1015 Stob Cadha Gobhlach is Sgurr Fiona instead of Bidein a' Ghlas Thuill, and the parent of 811 Ciste Dhubh is Mam Sodhail not Carn Eighe.

For Donald Tops the 1953, 1969 and 1974 editions of *Munro's Tables* show the hierarchy correctly but later editions do not. For example, hill 1652 Ben Ever is a top of Ben Cleuch but from 1981 onwards is shown underneath Blairdenon Hill, and hill 1897 Coomb Dod is shown above rather than below its parent Hillshaw Head. Parents of former Section 13—Appendix hills and the Glen Artney hills that entered the *Tables* in 1997 have been assigned by us.

### Parent (Ma)

The hill number and name of the parent Marilyn of lower prominence hills. In the Excel and csv versions the hill's own number is given for hills that are parents (there are no parents of parents) and '0' indicates a non-Marilyn with no parent. Thus a filter or sort on this column will return a parent (usually first) and all its children. An equivalent facility is provided in Access within the "Parent (Ma)" query, accessible from the *Queries* menu.

Tidal islands lacking a Marilyn will have a parent if the col height is greater than zero when measured to the appropriate datum (Ordnance Datum Newlyn in mainland Britain, Malin Head for the Republic of Ireland, and Belfast for Northern Ireland).

### Section

The RHB/TACit Section number. Sections 1-17 correspond to those in *Munro's Tables*, enlarged to include lesser hills. In *Corbett Tops and Corbetteers* (1999) sections 5, 7 and 8 were split for the first time into West (A) and East (B) sections. Section 26 was subsequently split in the Graham Tops booklet. Note that 10A and 10B in *Munro's Tables* do not correspond to 10A and 10B in RHB.

Sections 43-56 apply to Ireland. We have created Section 57 for the Channel Islands.

Subsequent to the publication of RHB, the boundary between Sections 1 and 26 was moved to follow the course of the Highland Boundary Fault, resulting in some hills being moved from 1B to 26B. The boundary between Sections 10B and 10C was moved eastwards to Loch Blair and the Allt a' Choire Riabhaich. This resulted in Sgurr Mhurlagain being transferred from 10B in RHB to 10C in *Corbett Tops and Corbetteers*.

Hills duplicated in more than one section of the RHB/TACit Tables, or which could be put in more than one section, have been treated as follows:

#### Hills on the England-Scotland border

These hills belong to both Section 28B and Section 33 and are searchable in both sections in Hill Bagging and Access. In the Excel and csv versions they have been assigned to Section 33 with the exception of Cairn Hill West Top in 28B. This Donald Top does not appear in English lists (except as a deleted Nuttall, under the name Hangingstone Hill) as the drop before ascending to Cairn Hill is only 5m.

#### Black Mountain (2242, Wales)

Formerly listed in RHB/TACit as belonging to both England and Wales, but from May 2007 deemed to be in Wales only (32A) for the purposes of lists and databases. The summit is in Wales.

#### Cuilcagh (20137, Ireland)

Assigned to Section 45D by Clements but is on the International border and the 44A/45D boundary. Cuilcagh is deemed to be in 45D in the Republic of Ireland.

### Section name

The name of the RHB/TACit Section.

### Area

This field is used principally for the following:

- Donald Sections in *Munro's Tables*



Wainwright volumes

- Nuttall book chapters
- SIB Regions
- Irish hills

Nuttalls and Donalds area names are used for all hills belonging to those lists. This facilitates comparison with the original lists and will also serve for sorting Wainwrights by volume. For islands, the area name is taken from the maritime Region set out in The Significant Islands of Britain and Ireland (SIBs) by Alan Holmes. Within the Irish mainland, most hills are given the area names in use by MountainViews. Lower hills not belonging to the relevant hill list may not have had their Area assigned.

A few hills on the Scotland–England border belong to "Cheviots" in the Nuttalls' volume and "Roxburgh and Cheviots" in the Donalds listing in *Munro's Tables*. This presents a problem with the Excel and csv versions of the database, unless one adopts the clumsy solution of giving each list a separate Area field. Furthermore, in version 12 we wished to assign area names to other Lowland hills and "Roxburgh and Cheviots" is far from ideal. All versions of *Munro's Tables* prior to 1997 give two areas, "Roxburgh" (section 11) and "Cheviots" (section 12). The SMC amalgamated the two regions when they removed Auchope Cairn and the six unnumbered English tops in 1997, leaving only three hills in total. We decided the simplest solution was to revert to the pre-1997 sections, as "Cheviots" is also the Nuttalls area name. Accordingly, 1906 Cauldcleuch Head is in "Roxburgh", and 1846 Cairn Hill West Top, 2303 Cairn Hill and 2305 Auchope Cairn are in "Cheviots". There is no conflict between Nuttalls and Wainwrights because the Nuttalls use the Wainwright volume titles.

For Wainwright Outlying Fells we have extended the areas defined in the Pictorial Guides by continuing the Windermere boundary southwards along the River Leven to Greenodd, and from Bassenthwaite Lake north-west along the River Derwent. In England and Wales, Nuttall and Wainwright areas have been assigned to many other hills falling within their boundaries, with *Central Wales* subdivided into three regions, but this process is incomplete for the Tumps.

In Wales, we needed to define the boundary between the Arans and Berwyns for the hills south of Bala from Rhiwaedog-uwch-afon (3421) in the north to Mynydd Maes-glas (3424) in the south. The easiest solution would be to put them all in the Arans or all in the Berwyns. However in the Nuttalls' book, Moel y Cerrig Duon (2116) belongs to the Arans and Foel y Geifr (2115) and Foel Goch (2123) to the Berwyns. Topographically this is not logical, but the Nuttalls clearly did so because Moel y Cerrig Duon is conveniently included in the same walk as the hills west of the road summit. Our solution is to assign those hills south of Moel y Cerrig Duon and south-west of Lake Vyrnwy to the Arans, and those north of Moel y Cerrig Duon and to the north-east of Lake Vyrnwy in the Berwyns, with the exception of Moel Eunant (3412) which is a satellite of Moel y Cerrig Duon. We feel this is the best we can do without breaking the alignment with the Nuttalls' book.

To divide the Arenigs from the Moelwyns we chose to make the boundary Ffestiniog-B4391-B4407. There are other options but none are demonstrably better. The Moelwyns (as defined by the Nuttalls) span two RHB sections, 30B and 30D.

## Island

In Excel, the island name for British hills having two or more Tumps on an island landmass. For islands that are connected to higher ground via a landbridge, when the tide is between MHWS and MLWS, (t) is appended to the island name to indicate 'tidal'. Islands with fewer than two Tumps are in one of four categories: Mono Tump island; Mono Tump island (t); Non Tump island & Non Tump island (t).

In the Access version, the island name is shown in the Area field. To search on this field in Hill Bagging, list the SIBs and then select Hills by Island from the menu on the left.

The DoBIH does not currently offer an Irish island list.

## Topo Section

The geographical region according to the scheme published in Mark Jackson's [Humps e-book](#). Z08–Z16 were subsequently added to accommodate Tump islands. In Access, the Topo Section is a searchable option in the Area/Region dropdown box; in the results screen it is given in the bottom row of the Areas/Regions table.

## County

This field is shown in the Excel/csv versions and on Hill Bagging. It gives the Current County or Unitary Authority for the hill. The Access version does not give the county in the search results but offers a search of all hills by county in the Areas/Regions dropdown box.

Membership is calculated using the grid reference and pre-programmed polygons approximating the county boundaries. It may occasionally misassign a hill close to a boundary. Please let us know if you discover an error.

### Catchments

This field appears only on Hill Bagging and applies to hills on the British mainland. Every river that reaches the shoreline and has at least 10 Tumps within its rainfall catchment area is eligible. "Shoreline" is defined as being between MLWS and MHWS, permitting the largest estuaries to be subdivided. Thus Earn is separated from Tay but the Almond is not because it meets the Tay above the MHWS line. Humber is split into Derwent (Goole)/Ouse (York)/Wharfe/Aire/Don (Thorne)/Trent to produce catchments of a manageable size, but the Swale, Ure and Calder are ineligible because they do not descend to MHWS. Just over 900 hills around the perimeter of the British mainland do not fit into a 10+ Tump catchment. Accordingly, they appear in Minor Rivers only (North) and Minor Rivers only (South). As their name implies, other hills that sit on a boundary with any Minor River are not included. Manmade changes for land drainage, drinking water, hydro-electric power and fishing are excluded. In Scotland particularly, sea lochs and bays are used to give catchment names that are meaningful to baggers. Hill summits within each catchment are augmented by those that lie just outside it but within 100 metres of the catchment boundary, unless this augmentation extends into the 100m area around an adjacent hill. Many hills appear in two catchments and 53 hills appear in three. The latter are identified in an additional category called "Triples".

### Watersheds

This field is also restricted to Hill Bagging. The data for Watersheds is derived primarily from a search for hills that appear in more than one Catchment. Watersheds are made up of British hills in the DoBIH whose summits lie within a 200m wide ribbon of terrain. Within this ribbon, rain will flow down both sides of every hill into opposing river catchment areas. There are 11 long distance routes across the length and breadth of the British mainland together with catchment boundary circuits of 17 of our greatest estuaries, bays and firths. A further 8 rivers with large populations are included, as are North—South routes across Shetland and the Outer Hebrides. Most of the 17 circuits involve a recombination of catchments, e.g. Humber Estuary encompasses Derwent (Goole)/Ouse (York)/Wharfe/Aire/Don (Thorne)/Trent. Firth of Tay does similarly for the Tay and Earn and goes right to the estuary's mouth.

### Classification codes

|      |                    |                 |  |
|------|--------------------|-----------------|--|
| Ma   | Marilyn            | W               | Wainwright                                       |
| Hu   | Hump               | WO              | Wainwright Outlying Fell                         |
| Sim  | Simm               | B               | Birkett  |
| 5    | Dodd               | Sy              | Synge  |
| M    | Munro              | Fel             | Fellranger                                       |
| MT   | Munro Top          | CoH             | County Top – Historic (pre-1974)                 |
| F    | Furth              | CoA             | County Top – Administrative (1974 to mid-1990s)  |
| C    | Corbett            | CoU             | County Top – Current County or Unitary Authority |
| G    | Graham             | CoL             | County Top – Current London Borough              |
| D    | Donald             | SIB             | Significant Island of Britain                    |
| DT   | Donald Top         | Dil             | Dillon   |
| Hew  | Hewitt             | A               | Arderin  |
| N    | Nuttall            | VL              | Vandeleur-Lynam                                  |
| Dew  | Dewey              | O               | Other list                                       |
| DDew | Donald Dewey       | Un              | unclassified                                     |
| HF   | Highland Five      | <i>prefixes</i> |  |
| 4    | 400-499m Tump      | s               | sub  |
| 3    | 300-399m Tump (GB) | x               | deleted  |
| 2    | 200-299m Tump (GB) | <i>suffixes</i> |  |
| 1    | 100-199m Tump (GB) | =               | twin   |
| 0    | 0-99m Tump (GB)    |                 |  |

We identify deletions only for SMC lists, Grahams and Nuttalls. See [Deleted Tops](#) and [Subs](#) for details of these categories.

Other searchable categories not shown in the classification field are as follows:

|     |       |      |           |
|-----|-------|------|-----------|
| Tu  | Tump  | T100 | Trail 100 |
| Mur | Murdo | Y    | Yeaman    |

|     |                |     |         |
|-----|----------------|-----|---------|
| CT  | Corbett Top    | Cm  | Clem    |
| GT  | Graham Top     | Ca  | Carn    |
| B&L | Buxton & Lewis | Bin | Binnion |
| Bg  | Bridge         |     |         |

The MT, CT and GT codes exclude Munros, Corbetts and Grahams, respectively.

Most unclassified hills are deletions. The remainder comprise two hills surveyed as falling short of Nuttall status before we adopted other recording systems, and a few that existed on Hill Bagging before the databases were merged in v11. The Comments field should explain the presence of the hill in the database and will generally give the date of deletion. Further information may be available in the Change Log accessed from the hill's page on the Hill Bagging website.

### Height and Grid Reference

Access and Excel have separate fields for 6-figure and 10-figure grid references. As explained below, the former is intended for use with maps and the latter for use with Garmin GPS instruments. Hill Bagging has a single field which gives the 10-figure grid reference if one exists and the 6-figure grid reference followed by (est) otherwise.

The treatment of man-made objects on summits is a contentious issue. The database adheres to the protocol described in [Summits and Cols](#).

### Great Britain

Much of the data originally entered into the database came from OS 1:10000 paper maps, as used by Dawson in the TACit Tables, with the remainder taken from OS 1:25000 and 1:50000 maps. From 2012 until the 1:10k feed ceased in late 2019 we made routine use of the large scale OS mapping on the [Geograph](#) website, which showed many spot heights absent at 1:25k and 1:50k including a good many at cols. This enabled us to refine many summit and col heights previously estimated by contour interpolation. Until May 2022 Magic Maps also offered 1:10k mapping; spot heights occasionally differed from Geograph. All spot heights on the original 1:50000 Landranger maps are metric conversions of older imperial heights and they are only slowly being replaced. Many of these old heights were obtained by theodolite and spirit levelling 100 years or more ago and are more accurate than the air heights on modern metric maps, but their positions on the map can be in error by up to 80m and, as with air heights, they are not always at the summit. For some hills we have taken levelled heights from old 1:10560 or 1:2500 maps, adjusting for the change in datum from Liverpool Dock to Newlyn in 1921 (most corrections are <0.3m). All the British hills in the database have been reviewed using online mapping resources, the Tumps being completed in March 2015. Further changes to data are inevitable as existing maps are revised and new mapping resources become available. The free [OS Maps](#) originally offered 5m contouring throughout Britain, enabling col interpolations to be refined. A statistical study showed that the estimates were appreciably more accurate than interpolations between 10m contours on Geograph mapping but the contours were occasionally unreliable. In July 2020 the contouring was downgraded to 10m spacing, but the Scotlis and DataMapWales websites offer 5m contouring from an OS digital height product. More information on online mapping resources is given on the [Links](#) page.

Spot heights often differ between scales. Most discrepancies are 1m. Differences of 3m or more usually correspond to non-identical locations. The error in air heights from photogrammetry is  $\pm 3.3\text{m}$  so it does not follow that one measurement is right and another wrong; they are just different estimates of the height. In 2016 we completed a statistical analysis of the [accuracy of map heights](#), using survey data on hundreds of hills from Alan Dawson and G&J Surveys. The study confirmed a previous finding that there is no difference in the accuracy of spot heights at different map scales, hence no reason to prefer larger scales.

LIDAR data is available in much of [England](#), [Wales](#), and [Scotland](#), though there is little data in the Highlands. In favourable terrain LIDAR heights are considerably more accurate than those from photogrammetry but are limited by the spatial resolution (50cm, 1m or 2m) and are adversely affected by vegetation. An increasing number of heights in the database (currently over 2,000) are taken from LIDAR, particularly for lower Tumps where coverage is greater. Because of the effort involved in analysing the data, the majority relate to new hills, those on the borderline of qualification for a list, hills where GPS submissions give conflicting summit locations, and hills where a surface network analysis conducted by Joe Nuttall on a digital elevation model derived from LIDAR and map data (JNSA) suggest the DoBIH location is incorrect. Decimal heights are given where justified by the nature of the terrain and/or our ability to identify the corresponding feature on the ground. Decimal heights from LIDAR can be identified by the absence of an entry in the [Survey](#) field. A comparison with heights surveyed by G&J Surveys is in progress. Some provisional conclusions are given in this [article](#) submitted to *Relative Matters* magazine. For information on JNSA and an account of the DoBIH Team's approach to analysing LIDAR data, see the article titled *JNSA, LIDAR and the DoBIH* linked on

the [Articles](#) page.

We now have 10-figure grid references from GPS measurements, LIDAR or surveys for most hills in the popular lists. As described below, we use these to derive the 6-figure grid reference. Other publications may give different data. Often this stems from the use of older or different scale maps, but in addition a surprising number of authors do not quote grid references correctly. By convention, a 6-figure OS Grid Reference is the address of the 100m square in which the feature lies. This is given by the co-ordinates of the south-west corner of the square (the same rule applies however many digits you quote). For example, the trig point of Great Shunner Fell is located at SD 84862 97290 so the correct 6-figure grid reference is SD848972. TACit Tables comply with this convention but some list authors incorrectly round to the nearest 100m; in the above example they would give SD849973. Another reason for published grid references not matching ours is that the true summit may not be identified on the map; there are many examples in the database where a spot height or trig pillar is not at the highest point.

Before truncating the entry in the [10-figure grid reference](#) field to create the 6-figure GR, we make a small adjustment to correct for systematic error in the GPS readout (see below). This ensures that 6-figure grid references and [xcoord](#), [ycoord](#) values are unbiased relative to the OSGB36 datum.

For Wainwrights the author sometimes gives a summit location that is not the highest point of the fell. This is particularly true of the Outlying Fells. Our policy is to take the location intended by Wainwright. We have followed the same policy with the Birketts. Where there is a conflict between the location implied in the text and the grid reference in Birkett's book we take the former. Any doubtful cases are mentioned in the Comments field. Note that when a Wainwright or Birkett lies close to a higher summit that features on a list defined by a prominence criterion (e.g. a Tump) we generally do not create a separate hill but reference it in the Observations or Comments field of the higher hill.

Metric heights are converted to feet using a factor of 1/0.3048.

### ***Ireland***

Irish data are primarily from 1:50000 2009 digital mapping supplied by OSi and OSNI. Heights surveyed by MountainViews are used where available. Reference to 1:25000 mapping has been possible in the Mourne and MacGillycuddy's Reeks. All these maps offer very few spot heights at cols. OSi is gradually publishing new 1:25000 maps in its Adventure Series but those seen by the authors have identical contours and spot heights to the 1:50000 maps, with very few additional spot heights. Harvey maps have provided some col heights in the Dunkerron Mountains, Maamturks, MacGillycuddy's Reeks, Mangerton, Purple Mountain, Twelve Bens and Dublin/Wicklow areas. We also consulted historic 1:10560 maps to obtain additional heights and resolve some location issues. Recently EastWest Mapping has published highly accurate 1:25000 maps of a number of upland areas in the Republic. These maps, based on BlueSky terrain digital elevation models (not LIDAR), have many spot heights at cols and heights are considerably more accurate than those on OSi maps. We plan to conduct a data review using the information in EastWest maps in 2023.

Vertical heights on current mapping are relative to mean sea level at Malin Head, the current datum for all 1:50k and 1:25k mapping in Ireland. Large scale mapping in Northern Ireland uses mean sea level at Belfast which is 0.037 meters below the Malin Head datum. Earlier maps, including the half-inch maps, the 1:63360 District Maps, and the 19th century 6-inch maps, use the low water mark of the spring tide on 8 April 1837 at Poolbeg Lighthouse, Dublin. The Malin Head datum is approximately 2.7m above the Poolbeg Lighthouse datum.

### ***Channel Islands***

Data are taken from Ministry of Defence maps at 1:25000, 1:10560 or 1:10000 scale based largely on 1960s surveys, supplemented by the States of Jersey Official Leisure Map (1:25000) and the States of Guernsey Official Map (1:15000, with 1:10000 coverage of Alderney, Herm, Jethou, Sark and Brecqhou on the reverse). The latter maps are published by Digimap, the official mapping agency for the Channel Islands. The older maps show many more spot heights than the recent maps. Admiralty charts were also consulted. Note that the vertical datum for the latter is MHWS rather than MSL and heights are quoted to the top of buildings rather than the ground.

Grid references are for UTM zone 30U and use the WGS84 datum. This grid is shown on the two "Official" paper maps although it is not the primary grid on the States of Guernsey Official Map, which uses the Guernsey Grid. The grid letters are WA for Alderney and WV for the other islands. Older maps use the ED50 European datum. The two datums give a difference of about 300 metres in grid reference. The extracts from the MoD maps published in the Sunflower guides, and some modern maps such as the 1:12500 International Travel Map of Guernsey and the smaller islands, use the older coordinate system so please bear this in mind when using the data. To avoid potential problems we recommend using latitude/longitude with third party applications.



Garmin GPS instruments use the WGS84 datum by default when set to UTM/UPS grid but return the absolute coordinates (shown in the [xcoord](#), [ycoord](#) fields) rather than the lettered GRs. The same is true of [GPS Utility](#). GPS Utility also offers the new Guernsey Grid.

There is also a new Jersey Grid, whose parameters can be found in a web search on "Jersey Transverse Mercator". This grid does not appear on the States of Jersey Official Leisure Map.

We are grateful to David Purchase for researching the maps and providing most of the data.

### **Col Height, Col Grid Reference and Drop**

Drop, also known as *relative height* in Britain and Ireland and [prominence](#) in the US, is defined as the height difference in metres between the summit and the col connecting the hill to a higher summit. Where there is more than one such col, the highest is chosen.

Cols are usually much less well defined than summits. Some 6-figure col grid references are subject to considerable uncertainty; even when spot heights are available, they are not always located at the col. Within much of Ireland there is no data beyond contouring for col position and height. There is, therefore, much greater use of contour interpolation and consequently lower accuracy.

Col heights and drops given to 0.1m are from surveys or [LIDAR](#), as are most col grid references given to 8 or 10 figures.

For offshore islands, the col height is taken as 0m by convention and the Grid Reference field shows "Sea". This is also the case for a tidal island if the land bridge is submerged when the tide is at or above the Datum (Newlyn for mainland Britain or Malin Head for Ireland).

As with summits, interference by man, whether by infilling or bridging the original col or creating a new one, necessitates a protocol for dealing with the altered topography. The rules followed by the database team are described in [Summits and Cols](#).

### **Grid Ref 10**

A 10-figure summit grid reference suitable for input to most hand-held GPS instruments, including all models in the Garmin range.

With the exception of measurements derived from LIDAR data, all measurements were obtained on the ground, the majority with hand-held GPS instruments. The error in such measurements has been determined as  $\pm 8.5\text{m}$  (three standard deviations) in three independent studies, with the majority accurate to within  $\pm 5\text{m}$  of the summit feature. Many are more accurate than this because they are the average of two or more independent readings. Any measurements with survey grade GPS receivers (indicated in the *Survey* field) will be accurate to 1m.

A comparison of 246 OS measurements on trig pillars with our GPS measurements in 2006 revealed systematic errors in the GPS data. On average, GPS eastings range from being 7m higher than OS eastings in the westernmost parts of Scotland to 1m lower in the east. GPS northings vary from being 14m lower than OS northings in Northern Scotland to 9m higher in SW England. We are grateful to Darren Parker who had himself discovered this error and researched its cause. We reproduce Darren's explanation below.

*The latitude and longitude shown on all Ordnance Survey maps except the most recent are determined with respect to the OSGB36 (Ordnance Survey Great Britain 1936) datum [this changed to ETRS89 in 2015]. The OSGB36 datum is based upon a ground survey performed between 1936 and 1953 and uses the ellipsoid defined by Sir George Airy in 1830. The latitude and longitude can be converted to planar coordinates using a Transverse Mercator projection (once the origin is defined) to give the National Grid references we use. Since the advent of GPS the method of defining the National Grid has changed. It is now defined using the latitude and longitude determined with respect to the ETRS89 datum (which is based upon the WGS84 datum and uses the GRS80 ellipsoid) which are then converted using a transformation known as OSTN15 with respect to OSGB36. The OSTN15 transformation is not a simple transformation defined by equations alone, but because of distortions in the OSGB36 grid, it makes slight shifts in northings and eastings. The grids of northing and easting shifts between ETRS89 and OSGB36 cover Britain with a grid resolution of one kilometre. The shifts of a particular point are then interpolated from this grid. The OSTN15 transformation can be performed online at [www.ordnancesurvey.co.uk/gps/transformation](http://www.ordnancesurvey.co.uk/gps/transformation) or using the GridInquest software obtainable via the site.*

*Thus the National Grid is now defined by ETRS89 and the OSTN15 transformation. A good guide to the subject is [A guide to coordinate systems in Great Britain](#). Also available is an [Excel spreadsheet](#) with many useful functions for converting from one datum to another.*

*The OSTN15 transformation replaced an earlier transformation called OSTN02 on 26 August 2016. The difference in positional coordinates is a few centimetres at most so has a negligible effect on the*



database. Most height changes are also insubstantial, but some heights in NW Scotland and the Scilly Isles have changed by up to 0.3m. This will affect some [surveyed heights](#) in the database.

A GPS unit determines the latitude and longitude of its position in the WGS84 datum (which is almost identical to the ETRS89 datum). In order to display this position as a British National Grid reference the GPS unit must perform a transformation. Unfortunately, the transformation equations stored in the unit are not as accurate as the OSTN15 transformation. Garmin and Magellan units use a transformation known as a Molodensky transformation (the equations and required parameters can be found in "Department of Defense World Geodetic System 1984 - Its Definition and Relationship with Local Geodetic Systems, NIMA TR8350.2, 3rd Edition, Amendment 1, 3 Jan 2000"). This leads to the discrepancies highlighted above. The transformations used by other manufacturers have not been investigated.

A number of strategies are available to remove the errors introduced by the Molodensky transformation. GPS waypoints can be downloaded to a computer using free or commercial software and the WGS84 latitude and longitude extracted. These can then be converted to British National Grid references using GridInquest or the online program, both of which have a batch mode facility. Alternatively, if the British National Grid references have been copied from the GPS screen, these can be converted back into WGS84 latitude and longitude values using the Molodensky transformation equations directly or by using either of the free programs [Geotrans](#) or [GPS Utility](#). As before, these can then be converted to British National Grid references using GridInquest. All three packages have a batch conversion facility.

When entering position coordinates of a location into a GPS, one has to bear in mind the source of the coordinates. If a grid reference has been read from the screen of a GPS instrument, then entering the grid reference into another GPS instrument using its own input screen will result in a point in the correct location (even though the grid reference may be incorrect). However, if the position coordinates are uploaded using computer software, the coordinates should be in the form of WGS84 latitude and longitude values.

Since we presume most users will be using 10-figure grid references for input to GPS instruments, we have **not** corrected the GPS measurements for the systematic error described above. Some ten-figure grid references were obtained with survey grade GPS receivers (see [survey](#)), and these instruments report accurate grid references to the OSGB36 standard. To align with the other data, the systematic error of the Garmin/Magellan instruments has been introduced into the grid reference using the reverse of the correction procedure described above.

Grid references from Satmap GPS instruments have a much smaller systematic error than the Garmin and Magellan instruments due to their use of a more accurate approximation to OSTN15. If you have a Satmap Active model you will obtain more accurate waypoints if you take the coordinates from the [lat/long](#) or [GridRefXY](#) fields.

Because 6-figure grid references are usually used with maps, we remove the systematic error in the 10-figure grid references before truncating them to derive the figure for the [Grid Reference](#) field. This is done automatically when applying a GPS update to the database by means of an Access VBA application that successively transforms the data to WGS84 and OSGB36 using components of GPS Utility and GridInquest. This operation also populates the [Latitude and Longitude](#), [xcoord](#), [ycoord](#) and [GridrefXY](#) fields.

The Irish National Grid was formerly defined by the Airy Modified Ellipsoid and the Ireland 65 map datum, which uses a transverse mercator projection. It is now defined with respect to the ETRF89 geoid and Irish Transverse Mercator. The transformation from latitude/longitude uses the OSi/OSNI Polynomial Transformation, which can be performed by GridInquest or [online](#). Irish GPS measurements undergo the correction procedure outlined above for British data. OSi and OSNI changed the geoid model on 26 August 2016 in parallel with OS. Unlike OS they did not change the horizontal transformation, but heights have changed by up to 0.2m in the west of Ireland.

The feature to which the 10-figure grid reference refers is identified in the [Feature](#) field. Alternative candidates for the summit and other features of interest are given in the Observations field. Many GPS data contributors submit measurements for other locations that are not summit contenders. Only a few of these are entered in the DoBIH, but all are recorded in the [GPS database](#) from which the entries in the DoBIH are derived.

### **Submitting 10-figure grid references**

It is our aim to obtain GPS-measured ten-figure grid references for as many hills as possible. Please contact us if you would like to contribute. Each entry in the GPS database is credited to the person who made it. Please record: name and number of hill, ten-figure grid reference, height as given by GPS, precision of GPS at time of measurement (if known), the feature the measurement refers to

(e.g. cairn), your name and the date on which the measurement was made. To prevent transcription errors it is helpful if you can use this [Excel template](#); however we will accept data in any format. You can also submit your data on [Hill Bagging](#) if you are a registered user. Your GPS should be set up according to the manufacturer's instructions using British Grid as the position format and Ordnance Survey GB as the map datum. For Ireland, use Irish Grid (not Irish TM) and Ireland 1965, and for the Channel Islands, UTM/UPS and WGS84. GPS instruments take a few minutes to stabilise and give reliable data, particularly older models that do not receive the GLONASS satellites. Try to remember to switch on your GPS a few minutes before reaching the summit and try to leave the unit for at least five minutes to settle once it has locked on to satellites before taking a reading.

Some newer GPS instruments, e.g. Garmin Oregon and Montana models, have a built-in barometric altimeter and use this by default to record height in preference to the height measurement of the GPS. Please record the GPS height and not the height from the barometric altimeter.

If you have a Satmap Active GPS, please submit your measurements as lat/long. These instruments use a different transformation to convert lat/long to grid reference from Garmin models so we have to process the data differently. Our preferred format is decimal with a minus sign for W, e.g. 57.13781 - 3.58466.

Please send your GPS data to [Graham Jackson](#) for British hills and to [John Barnard](#) for Irish hills. We welcome your input.

We do not publish 10-figure grid references from maps because spot heights and trig points are frequently not at the summit.

For a list of those who have contributed data, please see [acknowledgements](#).

### **Feature**

The feature on or around the summit to which the 10 figure grid reference refers. The summit area may be adorned with several objects (trig pillar, cairn, wind-shelter, fence etc.) and the resolution of the GPS is usually sufficient to be able to distinguish the positions of these features. Note that a cairn or trig pillar is not always at the highest point of the hill, which may itself be featureless. Consequently, the Feature field may contain the entry 'no feature' even though a cairn, trig or other feature is in the vicinity. This is particularly likely for hills that have been surveyed. In such cases the Observations field may contain a ten figure grid reference for the cairn or trig.

Where no survey equipment has been employed, we do not claim that the feature and its accompanying ten-figure grid reference represents the true summit of the hill; it is the best endeavour of the contributor who submits the data.

### **Observations**

This field contains information that supplements the Feature field. Most often it gives ten-figure grid references for other high points, either alternative summit locations or features that have been surveyed as lower.

### **Survey**

This field records whether any of the summit position, height, drop, col height or col position were determined by surveying, and if so the instrument(s) used. Data given to one or more decimal places are usually from survey measurements. Thus for hill 2051 Mynydd y Cwm the *Survey* field contains "Leica NA730/Leica 530" showing that these instruments were used in the determination of col position, col height, summit position and summit height; the respective fields contain entries to 0.1m. We include "LIDAR" in the *Survey* field only if the data were used in conjunction with an instrumental survey, e.g. on 19212 Currock Hill and 18430 Warren Hill.

The protocol used by the DoBIH for defining heights and positions in the presence of water features, moveable rocks, man-made structures, or when ground has otherwise been disturbed by man, is explained in [Summits and Cols](#). This protocol is also followed by the MountainViews surveyors in Ireland.

The most basic surveying tool we use is an Abney level which has a practical resolution of about 50cm of height per 100m of distance. This is sufficient to enable the true summit position of most hills to be determined, although the relatively poor resolution only permits height differences to be determined semi-quantitatively. A few summits in the vicinity of trig pillars were levelled to the flush bracket by Abney Level; the height difference from the figure in the OS Legacy Database was used to estimate the summit height. Our [guide](#) to choosing, calibrating and operating an Abney Level may be helpful to walkers using these instruments. Recently some contributors have acquired Hand levels with a 2x magnification manufactured by Kuker-Ranken or Seco. Our initial evaluation suggests these levels can give a resolution of 20-30cm per 100m distance in favourable conditions, the stability of the level being critical. However they are more awkward to calibrate than an Abney Level.

For hills where greater resolution is required, the survey team initially employed a Leica Runner 20 Automatic level, and subsequently a Leica NA730 Automatic level, purchased by a DoBIH editor. The Leica Runner has a x20 telescope and gives a resolution of about 1cm of height per 100m of distance, while the NA730 boasts a x30 telescope and correspondingly higher resolution of about 0.5cm of height per 100m of distance. An Abney level is a small device weighing about 150g which easily packs into a rucksack. An automatic level, e.g. a Leica Runner or a Leica NA730, weighs about 1500g, occupies significant space in a daysack and also requires a sturdy tripod.

The survey team also has access to a Leica Disto A8 laser measurer that measures both distances and angles. This was used to survey Castell y Gwynt and the depth of the railway cuttings at the cols of Lambrigg Fell and Milk Hill.

Optical levels are of limited use for determination of absolute height because they require a suitable datum e.g. a trig point of similar altitude that can be sighted directly or indirectly. Hills surveyed by this means include [Birks Fell](#), Cracoe Fell and [Great Yarlside](#). Optical levels enable accurate measurements of drop by differential levelling, and this has enabled us to determine the status of hills on the borderline of inclusion in the Nuttalls' and Dewey's lists. Because of the number of staff placements required and the time this would take, the technique is impractical for determining Marilyn status, where the drop is 150m. [Differential GPS](#) does not have these limitations, enabling accurate determination of height and drop for most hills. In 2009 a Leica 530 survey-grade GPS system was acquired, which was used on all surveys requiring accurate determination of summit height and for most measurements of drop. Prior to this purchase we surveyed [Craig Fach and Mynydd Graig Goch](#) by differential GPS in collaboration with Leica Geosystems. Many hills have had their drop measured by both optical levelling and differential GPS. Agreement has invariably been excellent, but levelling is more accurate.

In October 2012 G&J Surveys purchased a Leica Viva GS15 Professional GPS receiver to replace the Leica 530. The precision of the two instruments is comparable and dependent on the data collection time. For the GS15 the precision has been determined from two independent repeatability studies. For 30 minutes data collection this is about  $\pm 0.07\text{m}$ , for one hour's data collection  $\pm 0.06\text{m}$  and for 2 hours data collection  $\pm 0.05\text{m}$ . These ranges are quoted as three standard deviations either side of the mean and can be regarded as a "practically certain" confidence interval (over 99% probability) for the true height. G&J Surveys generally uses 1 hour's data collection, but 2 hours when heights are to be ratified by Ordnance Survey. Where the new instrument has been used the Survey field contains the entry "Leica GS15".

The overall precision of a measurement is also dependent on the correct location of the col and/or summit. G&J Surveys does this with level and staff and in the case of cols takes measurements on a grid of flags laid out over the col area in order to determine its topography. This enables them to locate the position of the col as accurately as possible. For most of their surveys the overall uncertainty in summit height is  $\pm 0.1\text{m}$  and of col height  $\pm 0.15\text{m}$  (3 s.d.), but the nature of the terrain (see below) is critical. For more information see the survey report for the particular hill.

During 2012 a Leica RX1250 GPS receiver was acquired by Alan Dawson. His survey results are recorded in the DoBIH. The instrument's precision is the same as that of the GS15. Up to late 2012 no instrumental method was used to locate a summit or col, but a Leica Disto laser level is now used for summit determinations. These surveys are identified by "Leica RX1250" in the Survey field. Survey reports produced by Leica Infinity software are uploaded to the [Pedantic Press](#) website. Some earlier reports may be found at [www.rhb.org.uk](http://www.rhb.org.uk).

In December 2013 Myrddyn Phillips purchased a Trimble GeoXH 6000 receiver. His survey results up to the end of 2015 are included in the database. The precision of this instrument at that time was  $\pm 0.3\text{m}$ , poorer than the Leica instruments, but the Trimble has greater portability and requires much shorter data collection times. No instrumental method is used for locating a summit or col. Data in Wales and England identified by "Trimble GeoXH 6000" in the Survey field are from this source, with the exception of some measurements on hills in the Llyn peninsula surveyed jointly with MountainViews and a few surveys of northern hills by Alan Dawson.

In Ireland, MountainViews has surveyed many hills with a Trimble GeoXH 6000 receiver and some with a GeoXH 5000 instrument. As of October 2022, 237 Irish hills quote heights obtained with their instruments. A number of surveys were carried out jointly with MountainViews at the end of August 2013 to compare measurements made with their instrument and ours. The results are reported in [A performance evaluation – Trimble GeoXH 6000 vs. Leica Viva GS15 Professional](#). Some further comparisons were made in Ireland in September 2015 and agreement was again very good.

When surveying summits and more particularly cols, the overall accuracy of the measurements is more often determined by the nature of the terrain than by the limitations of the equipment. If a summit is covered with thick tussock grass or heather, it can be difficult to establish the summit

location even using automatic level and staff. In a very few surveys we have determined, from variation in level and staff measurements, uncertainties of up to  $\pm 0.2\text{m}$ . The situation is worse for cols of complex topography and thickly vegetated terrain, when uncertainties could reach  $\pm 0.5\text{m}$  on occasion. Clearly, without instrumentation to locate summits and cols, it is sometimes impossible to produce satisfactory estimates of the uncertainty in the measurements, which could exceed the above figures.

The heights of Foinaven and Beinn Dearg were measured by a survey company, CMCR, for The Munro Society.

Reports by G&J Surveys can be read on [Hill Bagging](#). For details of the surveying methods and more detailed discussion of the accuracy of the measurements, see [The Accuracy of The Munro Society Heighting Surveys](#) and [Determination of the Random Error in Level and Staff Measurements](#). Video footage of some of the surveys can be viewed at [G&J Surveys](#).

Where an instrument was not required to determine the summit position, 'obvious summit' is recorded in the *Survey* field. A blank field denotes that the hill has not been surveyed.

### County Top

In Excel/csv, the relevant county or counties for a County Top.

### Revision

The date of the last change to the primary data: classification, 6-figure GR, height, drop and col location.

### Comments

Significant revisions, alternative summit locations not from site visits (which would be reported in the Observations field), and other explanatory notes. We do not comment on revisions of a routine nature.

### Streetmap/Mountainviews

Link to an OS 1:25000 map on [www.streetmap.co.uk](http://www.streetmap.co.uk). Smaller scales are available. For hills lacking a 10-figure grid reference the arrow will point to the SW corner of the 100m square defined by the 6-figure GR.

For Irish hills, link to the hill's page on [MountainViews](#). For hills not offered by MountainViews no map will be shown. For Northern Ireland, the resources on the Links page of this website can be used to access 1:50k and 1:10k mapping.

### Hill-bagging

Link to the hill's page in [Hill Bagging](#). The page offers links to additional mapping resources including OS Maps, Magic Maps, NLS (for historic mapping) and OpenStreetMap. OS Maps used to offer 5m contours and Magic Maps additional spot heights at larger scales, but the current products are less useful. Scotlis and DataMapWales offer 5m contouring derived from a superior OS digital product. See [Links](#) for information on these resources,

### Geograph

Link to Geograph offering OS mapping at 1:25000, 1:50000 and 1:250,000 scales and photographs within each 1km square. Previous feeds offered a larger scale with contours and additional spot heights but these disappeared some years ago.

Detailed mapping is not available in the Channel Islands and Ireland, where Geograph uses Google Maps and OpenStreetMap, respectively.

### xcoord, ycoord

Absolute grid reference (eastings, northings) in metres relative to the Ordnance Survey National Grid origin, Irish Ordnance Survey National Grid origin, or UTM zone 30 origin as appropriate. Required by some GIS software e.g. ArcView and MapInfo. Not available on Hill Bagging except via the Geograph link, where it is shown on moving the cursor inside the zoomable map.

### Latitude, Longitude

WGS84 coordinates calculated from the xcoord, ycoord values. The accuracy will depend on the source of the measurement. Use of latitude/longitude gives compatibility across Britain, Ireland and the Channel Islands. Not available in Hill Bagging except by showing the map and moving the cursor to the triangle marker.

### GridrefXY

True 10-figure grid reference, for use with maps. Exactly equivalent to xcoord, ycoord.

For hills having an entry in the [Grid Ref 10](#) field, the systematic component of the GPS error has



been removed. For hills lacking a 10-figure GR, the 6-figure GR is converted to a 10-figure GR by padding with zeros. Used for generating the Geograph map links, which unlike Streetmap do not accept xcoord/ycoord or lat/long. Not shown in the search results table or in Hill Bagging, but available in the hills table of the Access database and in the Excel and csv versions.

## **\_Section**

A numeric version of **Section** given in the Excel and csv versions.

## **MVNumber**

For Irish hills, the MountainViews hill number, as given in the hill page's URL on the [MountainViews](http://MountainViews.ie) website which takes the form *mountainviews.ie/summit/xxxx* where xxxx is MVNumber. Shown in the Excel and csv versions, and in the MVNumbers query in Access.

## **Changes and issues**

Background on hill classification changes and issues referenced in the Comments field of the database or of general interest is given below. Hills are listed in Section order.

### **Beinn a' Chroin (2925, 1C), Beinn a' Chroin East Top (36, 1C) and Beinn a' Chroin West Top (37, 1C)**

All editions of Munro's Tables up to 1997 give hill 36 as the Munro and hill 37 (West Top) as a Munro Top. Research by Richard Webb suggested that a summit 200m east of the West Top was higher than the Munro as long ago as 1983. The current 1:50000 and 1:25000 maps show a 942m spot height at NN387185, which the OS indicated is rounded from 941.5m. The SMC has given this summit (hill 2925) as the Munro since at least 2009. We assumed the former position of the Munro would become a Munro Top (now confirmed as the East Top). The West Top is only 200m from the Munro with a surveyed drop of 18.5m, but it was not until 2020 that we had confirmation that it was deleted. A survey by Alan Dawson has confirmed that hill 2925 is higher.

To summarise, the current status of the Beinn a' Chroin tops is as follows:

- hill 36, NN394186, 940.1m  
formerly the Munro, Beinn a' Chroin in *Munro's Tables* (1997); now a Munro Top
- hill 37, NN385185, 938m  
listed as a Munro Top, Beinn a' Chroin West Top in *Munro's Tables* (1997); now deleted
- hill 2925, NN387185, 941.4m  
new position of the Munro, given in the fourth edition of the SMC guide *The Munros* (2021).

### **An Dun (399/400, 5B)**

Both the Marilyn and the Corbett were originally at the southern top. The Marilyn moved to the northern top in 1995 following the appearance of an 827m spot height on OS Maps, 1m higher than the south top. The 1997 edition of Munro's Tables made the same change. The [online version](#) of Munro's Tables then reverted to the southern top. A [line survey](#) by G&J Surveys in 2012 found the southern top to be slightly higher but the estimated height difference of 3cm was within the measurement error associated with finding the highest points on the ground. Ordnance Survey accepted the result and put an 827m spot on each summit. A GNSS survey by Alan Dawson in 2017 drew the same conclusion, following which the Marilyn summit was relocated to the southern top. Both surveyors agree that the two summits should be regarded as being of equal height.

### **Fiacaill na Leth-choin (560, 8A)**

This top first appeared in the 1921 edition of Munro's Tables and is described as being 2/3 mile WNW of Cairn Lochan. The [1900 1" map](#), and all later 1" maps, show a ring contour at NH9703 and this grid reference is given in the 1969 Tables. Although the mapping is incorrect, it nevertheless points to a location near the end of the ridge at NH975028 being the intended summit in Munro's Tables from 1921 to 1969. This was revised to the position of the 1083m spot height at NH 975024 in the 1974 Tables. The 1869 and 1902 6" maps have a 3556ft spot height here, but it was not used in the 1921 Tables which gives "3550 ap." and credits Sir Hugh Munro.

### **Carn Liath (595, 8B) and Creag an Dail Bheag (596, 8B)**

Both summits were for a long time marked as 862m on OS maps. Creag an Dail Bheag was the Corbett up to 1984 and Carn Liath from 1990. Alan Dawson [surveyed](#) both hills in September 2013 and found Creag an Dail Bheag was 1.5m higher. Accordingly, the Marilyn moved to Creag an Dail Bheag. Ordnance Survey subsequently processed the raw data and obtained 861.47m for Carn Liath and 863.02m for Creag an Dail Bheag, the accuracy being estimated as  $\pm 0.05$ m. They furthermore indicated that the mapping would be changed to show 861 and 863 respectively and that the spelling Creag an Dail Bheag would be shown at all scales. The SMC moved the Corbett back to Creag an Dail Bheag in 2015.



### **Corrieyairack Hill (632, 9B)**

There has been some controversy concerning the summit location and height of this former Corbett. The Corbett Tops booklet states that the new summit height is taken from the 1:10000 map and is 1m higher than the old top. This was supported by an Abney level survey in 2017. A GNSS survey by Alan Dawson found that the new summit position is 0.5m higher than the highest point in the neighbourhood of the old location. For the OS's reply to a query see [Marhofn 106](#).

### **The Saddle [Trig Point] (686, 10A) and The Saddle (688, 10A)**

Hill 688 has always been the accepted summit of the Munro. Munro's Tables give a height of 3317ft from 1891 to 1969, 3314ft in 1974 and 1010m from 1981 onwards. The trig point was a Munro Top between 1981 and 1990 and was listed as 1010m. There also appears a rather optimistic footnote from 1981 onwards "Observation on the ground gives the impression that the main summit of The Saddle is slightly higher than the Trig Point".

The current 1:25000 map gives a height of 1011m for the rocks near the trig pillar and 1010m for the Munro, resulting in the Marilyn being moved to hill 686 in August 2013. It reverted to hill 688 after that summit was surveyed as 0.3m higher in September 2014.

### **The Saddle West Top (696, 10A)**

There are two high points 100m apart at NG928128 and NG929128. From 1891 to 1969 the summit is shown as 3196ft and described as being ½ mile WSW of The Saddle. This is midway between the two, but the 3196' spot height on the 6" map corresponds to the eastern summit. The western high point is spotted 4ft lower at 3192'. The grid reference and height for the eastern summit are given in the 1974 Tables. The 1971 1:10k map was consulted, but there are no spot heights here so the editors gave a metric conversion of the 3196ft height. The 1981–1990 Tables give the western summit at NG928128 with height c968m. The 1:50k map, then as now, shows only an elongated 960m contour enclosing this section of the ridge. The top was deleted in 1997. Reproductions of the old maps are given in the Munrotab spreadsheet available on the Downloads page of this website.

### **Sgurr na Creige (706, 10A)**

The intended summit is uncertain. It is described in all editions of Munro's Tables as being half a mile north of the summit and about 3100ft in height (the first edition says over 3000ft). In the 1932 SMC Guidebook for The Western Highlands, though, Sgurr na Creige is described as being about 2850ft in height. A visit showed Sgurr na Creige to be a short undulating ridge with three small tops. The furthest from the Munro is 867m (2844ft) and is 1.1km (0.68 mile) along the ridge from the summit. The next top has been surveyed as 926.9m (3041ft) and is 0.7km (0.44 mile) from the summit with a drop of c.12m. The next after that is 933m (3061ft) at NG 93570 13715, 0.6km (0.37 mile) from the summit with a drop of c.8m. There are two other significant bumps closer to the Munro: a minor top at 940m, and finally the North Top at NG 93600 13403, 948.8m with 19.5m drop. We give the 926.9m summit in the database as it seems to best fit the description. It conforms to Munro's preference for choosing the highest 3000ft summit at or near the end of a ridge line, even if it was lower and less prominent than other summits along the ridge.

### **Buidhe Bheinn (713/715, 10A) and Sgurr a' Bhac Chaolais (716, 10A)**

Munro's Tables lists Buidhe Bheinn as the Corbett from 1953 to 1974, Sgurr a' Bhac Chaolais from 1980 to 1990, and both hills as Corbetts in 1997 despite the drop between the two being less than 500 feet. However the location of Buidhe Bheinn was mistakenly assigned to the west top at NG956087 (hill 715), whose height is given as 879m on OS maps. The 2002 edition of the SMC guide to the Corbetts corrected the location to NG963090 (hill 713), and this GR is now shown in the SMC's [online Table](#). Accordingly, we have classified hill 715 as a deleted Corbett.

Following a survey which found Buidhe Bheinn to be 29cm higher, the SMC demoted Sgurr a' Bhac Chaolais on [3 November 2012](#). Thus Buidhe Bheinn is now the sole Corbett. The following day it was reported on the rhb group that the Marilyn pair had been de-twinning and the Marilyn moved from Sgurr a' Bhac Chaolais to Buidhe Bheinn.

### **Sgurr nan Ceannaichean (900, 12A)**

Reclassified from Munro to Corbett following surveys carried out for The Munro Society. The news was announced at a press conference on 10 September 2009. Rab Anderson of the SMC was present and confirmed that Munro's Tables were changed with immediate effect. The SMC made the following statement:

*Following confirmation that the Ordnance Survey will adopt the height information from the recent surveys carried out by the Munro Society, the Scottish Mountaineering Club (SMC) can confirm that it will amend the official list of Munros (Munro's Tables®), which it maintains, to show that Sgurr nan Ceannaichean (913m) is now no longer a Munro. This change brings the number of separate summits in former SMC member Sir Hugh Munro's list of 3000 foot peaks to 283. Sgurr nan Ceannaichean will*

be added to Corbett's Tables which the SMC also maintains and all future SMC publications will show these changes. The SMC is grateful to the Munro Society for its efforts and for bringing this revised height information to its attention.

Surveys of Ben Vane (915.8m), Beinn Teallach (914.6m) and Sgurr a' Choire-bheithe (913.3m) confirmed the status quo.

### **Beinn a' Chlaidheimh (1024, 14A)**

On 4 July 2011 the height of Beinn a' Chlaidheimh was measured by G&J Surveys as part of a project for The Munro Society. A 3 hour dataset was sent to Ordnance Survey for processing who obtained a height of 913.96m. The Munro Society announced the result at a press conference on 9 August 2011. The new height indicated that Beinn a' Chlaidheimh should be reclassified from a Munro to a Corbett. In response the SMC said in a press release, *The Scottish Mountaineering Club has been notified of these survey results and has undertaken to consider the implications for Munro's and Corbett's tables when the Ordnance Survey update its map of the area.* The OS amended its online Get-a-map resource (now replaced by OS Maps) on 29 November 2011 to give a 914m spot height. The SMC finally accepted the reclassification on 6 September 2012. The news was first reported in [Grough](#).

### **Foinaven (1124, 16B)**

There had been speculation for many years that the height of this hill might reach 3000ft. Older 1:50000 maps show a spot height of 908m at NC316507, a conversion of an imperial height. It was eventually replaced by the 914m figure from the metric survey, though the spot is at NC315507 on the 1:10000 metric map. Anecdotally, the 1:25000 map briefly gave the height as 915m, later changed to 914m at NC316507. In response to an enquiry from the SMC in 1990, the OS confirmed the height as 914m but quoted a range of 913.8-915.2m including measurement error. The midpoint of this range is 914.5m, suggesting that the hill was more likely to be a Munro than a Corbett. The confusion was compounded by the spot height on the 1:25000 map being within the small 910m contour to the east of the ridge, rather than at the cairn inside the much larger 910m contour to the west which ground observation suggested was about 3m higher.

In 2007 The Munro Society commissioned a survey of Foinaven. The summit height, ratified by the OS, was reported as 911.0m. The new height is shown on the current 1:25000 map. A survey of Beinn Dearg (hill 970) commissioned at the same time confirmed the hill's Corbett status, the measured 913.7m equating to the old levelled height of 2998ft.

### **Knight's Peak (1261, 17B)**

Knight's Peak was controversially promoted to Munro Top in 1997 on the basis of an altimeter measurement. The accuracy of the published 914m height (by implication 914.4 or 914.5m) was openly questioned in parts of the hillwalking community, and appeared to be contradicted by Harvey's estimated 911m and a figure of 2994ft on the 1965 1:10560 sheet. In August 2001 the OS disclosed that it holds an unpublished air survey height of 912m for Knight's Peak. A spot height of 912m also appeared on Land-Form PROFILE, the OS 1:10000 digital height product. The OS height was adopted for the *TACit Tables*, so Knight's Peak became a 912m Corbett Top in 1999.

Then in August 2006 Ken Stewart obtained a new height of  $914.95 \pm 0.5\text{m}$  from the OS, derived from high order photogrammetry and GPS. On enquiring about the methodology, the OS replied *The photo model was controlled using sub 0.1m accuracy GPS (i.e. points on the ground were fixed that could be identified on the imagery - GPS was not taken to the summit). The accuracy of the imagery heighting using this method is quoted as  $\pm 0.5\text{m}$  for the Z (height) value.* Not everyone accepted the data as conclusive (see [issue 69](#) of [The Angry Corrie](#)). Knight's Peak was eventually reclassified from Corbett Top to Murdo in 2010, but doubts remained.

The issue was finally settled by a survey carried out on 13 September 2013 by G&J Surveys in conjunction with the SMC and The Munro Society. The higher of the two summit peaks is 914.24m and the lower one, measured by Alan Dawson, 914.16m. The deletion of the Munro Top was announced on 13 November on [BBC Scotland](#).

### **Meikle Millyea (1693/1694, 27B)**

The 1860 6-inch map shows a 2446ft (746m) triangulation station at the northern summit (hill 1694) and a 2455ft (748m) spot about 400m to the south-west (hill 1693). The latter position is also spotted 3m higher on the Harvey 1:40000 map. The TACit publications have given the southern location since 1995. The 2015 SMC guidebook *The Grahams & the Donalds* retained the trig point while recommending that walkers also visit the southern summit. However a survey subsequently conducted by G&J Surveys for the SMC has confirmed that the south-west top is indeed the higher, a result validated by Ordnance Survey. The 2021 SMC guidebook gives the southern location as the Donald.

### **Troweir Hill (1734, 27B) and Saugh Hill (5636, 27B)**

Saugh Hill became a twin Marilyn of 1734 Troweir Hill on 17 June 2011 following an examination of old maps. Both hills have a spot height of 296m at 1:50k. Large scale 19th century maps give levelled heights at the cairn and the tumulus with Saugh Hill 0.4m higher. A survey by Alan Dawson in July 2014 obtained a height of 295.6m for both summits but a drop of only 149.3. Accordingly, Troweir Hill was deleted from the Marilyns and Saugh Hill ceased to be a twin Marilyn although it remains a twin Hump.

### **Craig Fach (2032, 30B) and Mynydd Graig Goch (2033, 30B)**

These hills, both with spot heights of 609m on contemporary OS maps, were [surveyed](#) on 11 August 2008 by our survey team in collaboration with Leica Geosystems. Craig Fach's Dewey status was confirmed but Mynydd Graig Goch was shown to be over 2000ft high, making the hill a Hewitt and Nuttall. The event is described in the [press release](#). Many readers will be aware of the events that followed. The team had planned an announcement at Snowdonia Parks centre (Plas Tan-y-Bwlch) but had not achieved much success in getting the press to attend. Then the BBC got hold of the story and everything mushroomed, with coverage on Radio 4, BBC TV and ITV on Friday 19 September and in the national newspapers the following morning. The promotion of Mynydd Graig Goch to "mountain" status may have provided the whimsical note that captured the nation's interest, but a contributory factor might have been the relief afforded from the relentless stream of financial and economic bad news.

### **Mynydd y Cwm (2051, 30C)**

New Marilyn announced on the rhb group on 16 April 2009. The measured drop of  $150.00 \pm 0.2\text{m}$  sparked some debate as to whether the promotion was justified. However all hill lists, whether the authors recognise it or not, are based on the premise that a hill belongs if it has a 50% or greater probability of meeting the criterion.

### **Mynydd Ceiswyn (3431, 30F) and Domen-ddu (3466, 31B)**

Added to the original list of 500m summits (with [Great Yarlside](#)) by Michael Dewey, but challenged on the rhb group by Rob Woodall and others. These hills, together with Great Yarlside, were promoted on the basis of measurements on walkers' GPS instruments, which lack sufficient accuracy for this type of work. All three hills have since been shown by accurate levelling to lack the required drop. Details can be found in [Survey Reports](#). A number of other Deweys, mostly hills added after publication of the original list, have been demoted after surveying. See the [Dewey change register](#) for a full list of changes.

### **Rhiw Gwraidd (2196/2197, 31B)**

A levelling survey in 2006 was unable to resolve the summit location as the height difference was within the measurement error. A [second survey](#) in June 2010, using equipment capable of higher resolution, found the east top to be 7cm higher. Accordingly hill 2197, formerly an alternative summit mentioned in the rhb update sheet, is now the Marilyn. Hill 2196 has been renamed West Top.

The 1:25000 map is misleading, as the summit is within the 440m contour ring 160m to the east of the easterly 442m spot.

### **Fan Brycheiniog (2230/5603, 32A)**

The 1:25000 map shows two 802m heights 300m apart. The Nuttalls originally regarded them as twin summits, while Terry Marsh claims the trig point is higher. The editorial team [surveyed](#) the hill on 13 September 2011 on an occasion to mark the 10th anniversary of the Database of British Hills. The northern summit, Twr y Fan Foel (hill 5603) is 0.75m higher than the trig point (hill 2230). The result was accepted by the list authors, so the Marilyn, Hewitt and Nuttall moved to hill 5603. Hill 2230 remains the Buxton & Lewis, Bridge and Trail 100 top.

### **Mynydd y Grug (5273, 32C)**

Old maps show the summit within a small 1175ft contour (358m) close to a trig station. The natural summit is now completely covered by a large spoil heap which is in the process of being drained and landscaped. The summit of the tip was marked with a 375m spot on the OS Openspace vector map and is 374m by LIDAR. This is higher than 2297 Mynydd Machen (362m), implying a reversal of the col positions and relocation of the Marilyn were the hill to be accepted. Alan Dawson considered the evidence and decided that the landscaping was insufficiently complete for the spoil heap to count as a hill. Accordingly, he reported on the rhb group that the Marilyn would remain Mynydd Machen for the time being. The majority of comments on the rhb group supported this decision. The latest satellite imagery (2021) shows that the hill is still substantially unvegetated.

[Summits and Cols](#) decrees that for an unfinished or incompletely landscaped artificial hill, a point on the perimeter is chosen to represent the summit. In practice it is not always easy to identify the highest natural ground. The choice of location is of some importance because if the height were below 350.6m (100m above the LIDAR height of the col) the hill would cease to qualify as a Hump. After

comparing the 1951 and modern 1:25k maps, the hill was given the benefit of the doubt and a point at ST 1755 9075, estimated at 355m, was chosen. In 2022 the hill was re-examined with the aid of LIDAR data and satellite imagery. The highest natural ground was estimated as 348.6m on the north side of the tip. The exact location is uncertain but is well below 350.6m. Accordingly the hill has been demoted to Subhump.

### **Housedon Hill (2318, 33)**

RHB gives the north top, which has a 267m spot height on the 1:50000 map misplaced on a 260m contour. This probably originates from a 876.9ft surveyed height on the 1866 1:10560 map which the old map marks on the boundary. The south top has a 266m air height on the 1:25000 map. Ground observations by George Gradwell with an Abney level found that the northern top lies near the edge of the wood and is marked by a small cairn. He also determined the south top to be marginally higher than the north top. A more detailed [Abney Level survey](#) found the south top to be 1m higher. LIDAR data has provided further confirmation.

### **Armboth Fell (2483/3761, 34B)**

Wainwright and Birkett give different [locations](#) for their respective summits on Armboth Fell. The Birkett summit is a large rock outcrop with a small cairn at the 479m spot height (NY 29677 15967). The Wainwright summit is a rock and heather outcrop at NY 29584 15740. [Photograph 1](#) shows this summit alongside Wainwright's sketch. The cairn has been reduced to a mere handful of stones and is no longer visible from below. Supporting evidence for the location of Wainwright's summit is provided by [photograph 2](#) which shows the "shepherd's cairn on a rock" alongside Wainwright's sketch. This can be found on a rocky outcrop at NY 29631 15534, which is almost exactly a furlong south of the Wainwright summit cairn. Again, the cairn on this boulder has been removed or destroyed. The prominence east of north mentioned in Wainwright's summit description is probably the 479m spot height.

### **Wether Hill (2557/2927, 34C)**

Formerly the Nuttalls listed the north top (hill 2557), which is the Wainwright and Birkett summit. Several visitors to Wether Hill have noted that the south top (hill 2927 and the Buxton & Lewis summit) appears to be the higher and this is supported by modern and old maps. The current 1:50k OS map shows a large 670m ring contour on the south top and a 670m spot height with no ring contour on the north top. The 1:25k map has a large ring contour on the south top and a small 670m ring contour on the north top. The 1863, 1899 and 1919 1:10560 maps have a 2203.0ft (671.4m) benchmark at the boundary stone on the north top (although this is not quite at the summit), while the 1899, 1919 and 1956 1:10560 maps have a 2211ft (674m) spot height on the south top, about 70m south of the summit. Both heights also appear on the 1915 1:2500 map, as does a 2186ft spot height (666m) which is a plausible candidate for the col. These old levelled heights are shown superimposed on the [1:25k map](#); the arrow shows the position of the 10-figure grid reference formerly in the database (it was replaced in v12.1 by NY45461630 20m SSW following the Abney survey). A detailed survey by Jim Bloomer with an Abney Level estimated the south top as 3-4m higher than the north top, supporting the mapping. The Nuttalls announced the move on [7 March 2012](#).

### **Baystones [Wansfell] (2607/3838, 34C)**

This hill has see-sawed in status. The original RHB publication (1992) lists Baystones as a Marilyn at NY403052 on the north side of the wall (hill 3838). All OS maps show a spot height of 487m at this point. It was demoted in 1995 when the drop was revised to 149m. Baystones was reinstated in May 2001 with relocation to NY403051 on the south side of the wall (hill 2607) following information from Ordnance Survey that suggested its height might be 488m. We have surveyed the hill by differential GPS and find the summit height to be 486.9m and the drop 147.7m. The second demotion of Baystones was announced on 11 Feb 2010. The northern summit was estimated as 0.83m lower by optical levelling and therefore 486.1m in height.

Prior to v11 we did not list the two summits separately. Hill 3838 was added to distinguish the location of the Birkett from the Wainwright and (sub)Marilyn.

### **Wallow Crag [nameless - Naddle Horseshoe 2] (3329, 34C)**

The location indicated on Wainwright's sketchmap does not match the route description, which in fact follows the ridge to Wallow Crag. There is no doubt of the correct summit as the sketch of the cairn on p.227 of *The Outlying Fells of Lakeland* matches the [photograph](#) on p.202 of Birkett's *The Complete Lakeland Fells* (the original photo is in colour but the scan has been reproduced in b/w to match Wainwright's sketch). The 410m contour ring at NY497148 is at best 412 metres high and is nothing more than a heathery mound that has clearly never had a cairn on it. Birkett's location is verified in a [photograph](#) of Wallow Crag taken by George Gradwell.

### **Great Yarlside (3661/2575, 34C)**



Added to the Deweys in 2005 on the basis of measurements on a walker's GPS instrument, but deleted on 16 November 2011 after a [levelling survey](#) demonstrated that the hill lacks the required 30m of ascent. The Wainwright Outlying Fell is hill 2575, close to a circular concrete trig station. The height was mistakenly given on OS maps as 1986ft (605m) at one time, probably a transcription error as it was previously 1936ft, leading Wainwright to choose that location.

### **Arnside Knott (3321, 34D)**

New Marilyn reported in 2005 in [Marhofn](#), previously not even a Submarilyn. A [survey](#) in October 2010 found the drop to be  $150.8 \pm 0.4\text{m}$ . The critical measurement is the height of the col, which is on a railway trackbed. The survey of the col is recorded in a [video](#). LIDAR data suggests an alternative col on the railway 1km to the south is 0.1m higher. This is on a man-made embankment 2-2.5m above the valley floor, under which a stream passes through a substantial stone arch. From a site visit we estimate the trackbed to be 1-1.5m above the top of the stone bridge on soil/ballast as a footing for the railway. We do not regard this feature as the col. The surveyed col was "natural" ground at the side of the trackbed (not on ballast); it may have been altered by man but there was always a col there.

### **nameless (Top o'Selside - Brock Barrow) (3335, 34D)**

Wainwright mistakenly applies the label *748' a nameless summit* (p.92 of *The Outlying Fells of Lakeland*) to the [square cairn](#) at SD 29814 89815, height 221m (725ft). A survey by Jim Bloomer and George Gradwell with an Abney level established that the true summit, a 229m spot height on OS maps, is a rock outcrop at SD 29885 89889. The square cairn was probably the highest point on Wainwright's route over the fell to a second cairn at SD 29809 90026 (sketch on p.94). We estimate the second cairn (within a small 700ft contour on the 1:10560 map) to be at least 5m lower than the square cairn and yet Wainwright declares it to be at approximately 730ft, supporting our conclusion that he believed the square cairn to be at the 748ft spot. The positions of the two cairns and the true summit are shown on this [map](#) and [photograph](#).

### **Burnhope Seat (2714, 35A)**

The Nuttalls give the trig point at NY788375 (746m), 350m from the true summit. They reported visiting the cairned point but did not think it was higher. Two independent surveys by Abney level supported our location, approximately 100m west of the 747m spot height on the OS 1:50000 map. More recently, LIDAR data has provided further confirmation.

The trig point is the historic County Top of Durham. In v14 we created a new hill (8036) for this summit, which is also the Bridge and Buxton & Lewis top. It is a moot point as to whether the Nuttall should be taken as the location given in the book or, given the prominence definition, the surveyed location. To avoid compromising the logs of walkers who only visited the trig but regard the Nuttall as bagged, we have retained the Nuttall as hill 2714 and amended the entry in the Comments field.

The only other Nuttall with a non-trivial difference between the surveyed and book locations is 2028 Pen y Castell, where the separation is 230m.

### **Thack Moor (2770, 35A)**

The summit is 15m east of a trig point whose height is given on maps as 609m. A survey in August 2012, in which 2 hours of data was collected by our Leica 530 differential GPS system, obtained a result of 609.64m. On the Ordnance Survey's recommendation, a further survey was conducted in March 2013 in which 4 hours of data was collected using our recently acquired Leica GS15 system. This dataset gave a height of 609.62m. The data were sent to Ordnance Survey who processed them through their own software and obtained 609.62m from both datasets. Hence Thack Moor exceeds 2000ft by 2cm, or less than an inch. OS accepted the result and show 610m on current maps. The Nuttalls, Alan Dawson and Michael Dewey also accepted the result, thereby promoting the hill to Hewitt and [Nuttall](#) and deleting it from the Deweys. The news was announced by [Grough](#) on 3 April 2013. For further details see the [survey report](#). Following the refinement of Ordnance Survey's geoid model on 26 August 2016, the height has been revised to 609.65m.

This is the converse of the original result for [Calf Top](#), another hill with a summit close to a 609m trig point where 6 hours of data collected on two surveys gave a height of 609.58m, 2cm below 2000ft, before the adoption of the new geoid model took it above the threshold.

### **Hand Lake (3608, 35A) and Linghaw (3609, 35A)**

Added to Michael Dewey's published list after discovery of tiny 500m contours on the 1:25000 map. Linghaw was subsequently demoted on 22 October 2010 after a survey revealed the height to be 498.8m, and Hand Lake on 25 November 2010 after the height had been measured as 499.6m. Contours on OS maps at 10m spacing are stated by the OS to be accurate to  $\pm 5\text{m}$ . Marginal Deweys have been a target of our surveying team since 2007, which has resulted in several changes to the list. For a complete list of changes see the [Dewey change register](#).



### **Calf Top (2797, 35B)**

Calf Top, originally on Dewey's list, has been surveyed a total of three times by G&J Surveys. The estimated height using the OSTN02 transformation was  $609.58 \pm 0.1\text{m}$ . As this was below 609.6m, the probability that the hill exceeded 2000ft was less than 50%, albeit marginally. Alan Dawson, John Nuttall and Michael Dewey were consulted and all were content for the hill's status to remain unchanged. For a summary of the surveys and the rationale for preserving the status quo, see [Is Calf Top a new 2000ft mountain?](#). Then on 26 August 2016 Ordnance Survey refined their geoid model, replacing the OSTN02 transformation with OSTN15. This gave a new OS ratified height of 609.606m. The list authors were again consulted and agreed to promote the hill to Nuttall and Hewitt and delete it from the Deweys.

### **Birks Fell (2799, 35B)**

Early lists of the English 2000s included Birks Fell on the basis of the 610m spot height at SD918763 on 1:50000 Landranger and earlier imperial maps. Later metric maps at 1:10000 and 1:25000 scale gave a 608m spot height at SD916764 instead. This caused the hill to be dropped from subsequent lists, and for the Marilyn to be moved to Horse Head Moor. The situation was confused by the continued appearance of the 610m spot on 1:50000 maps (known to be a metric conversion of an older imperial height) and a stream of visitors opining that the new 608m spot was not at the highest point. The OS was contacted but merely confirmed 608m as the highest recorded point on the metric contour document.

The impasse was resolved when in 2006 our survey team, in their first significant survey following the purchase of an automatic level and staff, line surveyed the hill from the trig flush bracket. A follow-up survey confirmed their finding that the hill was definitely above 2000 feet, their estimate being  $610.4 \pm 0.2\text{m}$  or between 2002 and 2003ft. Subsequently the Nuttalls obtained a revised figure of 2001ft at SD919764 from the OS (from a 1920 levelling survey) which they indicated will appear on the next update of the 1:25000 Explorer. The OS later (19 Dec 2007) indicated that the new 610m spot will be shown at SD 9186 7637, a little to the south west of the cairn and in agreement with the 1:50000 map. However they appear to have erred in putting the 610m spot at SD916763 on the latest 1:25000 map, approximately the same position as the previous 608m spot.

### **Raw Head (2828, 36)**

Demoted to Submarilyn after extensive surveying showed it to have a drop of 148.5m. Alan Dawson accepted the change on 16 April 2009, some weeks after the [survey results](#). Independent data from digital elevation models dismiss any real possibility that the col for Raw Head might lie in an area outside the surveyed region.

### **Milk Hill (2872, 39)**

Briefly acquired Marilyn status in 1997 when the TACit Table *The Hewitts and Marilyns of England* erroneously listed it in Section 42. A survey on 20 April 2009 confirmed the hill's status as both Submarilyn and the highest point of Wiltshire, being 0.25m higher than nearby Tan Hill. The OS confirmed these findings in their own survey. The survey was sponsored by the BBC and presented in a Countryfile programme on 23 August.

### **Botley Hill (2910/3686, 42)**

Several walkers queried the original location, suggesting that there was higher ground within the large 265m contour to the west of the trig point. The 1:63360 OS map gives a spot height of 882ft and on the strength of this evidence Alan Dawson announced a relocation in June 2008. A line survey confirmed that the highest natural ground is at TQ 38708 55182 around the base of the water tower compound, *ca.* 3 metres higher than the trig point flush bracket.

The relocation of this hill raises a bagging ethics issue for those who have only visited the original location. A resident of Scotland might feel aggrieved at having to make the long journey south to reclaim the Marilyn. However the Marhofn editor instructed HoF members to reduce their year-end total by 1 if they had not done so. A similar issue arose with the replacement of Sgurr a' Bhac Chaolais by Buidhe Bheinn, although many would regard it as *de rigueur* to climb both summits of a twin Marilyn. 19290 Hensbarrow Downs is somewhat different as it did not replace 2884 Hensbarrow Beacon until the area was settled and landscaped; some would see no reason to amend their logs if they bagged the Beacon while the Downs was still a spoil heap.

### **Crocknasmug (20445, 45A) and Crockaulin (20886, 45A)**

The original TACit publication (1997) listed Crocknasmug as the 328m Marilyn. Clements' note 189 states "328m given here is from OS4 (OSNI); only a 322m spot height on OS3 (Republic) at C656438. Were this point the summit, then Crockaulin, 325m, at C624420 would become the Marilyn". The 2009 digital OSNI mapping now duplicates the OSi 322 spot. This replacement of the old 328m height with a nearby 322m spot height, combined with a visit to both sites, led to the conclusion that Crockaulin (3.8km SW) was probably higher. In 2012 a survey with a Trimble

GeoXH6000 gave Crocknasmug 328m and Crockaulin (ground 200m N of trig) 326m. Consequently we have reinstated Crocknasmug as the Marilyn.

### **Bunnamimma (20656, 56A)**

This hill has been relocated twice and undergone a name change. To simplify the narrative below, the locations are referred to as follows:

- Point A: original location, H736153, Carrickatee
- Point B: first relocation, H726148, Carrickatee (Carrickaveilty on maps)
- Point C: second relocation, H718146, Bunnamimma

In *The Hewitts and Marilyns of Ireland* published by TACit Press, Clem Clements listed point A as a 270m Submarilyn with c.148m drop. When the hill entered the DoBIH in 2011 it was relocated to the 270m trig at point B and the col height increased by 10m, causing it to be deleted from the Submarilyns. Then in 2014 David Purchase wrote to us to propose a relocation to point C based on a site visit in 2003. He commented that although the original OSi maps D28A and D28B spotted point C at 266m, as does the OSi viewer, the current D28 map (an OSNI production) shows a small 270m contour there without a spot height. He found no trace of a trig pillar at point B. A poster on [MountainViews](#) confirmed the lack of a trig pillar and was informed by OSi that the trig is not a pillar but the top of a water tower. The original (1982) D28 map shows a 266m spot height a short distance SE of where the trig symbol is now shown, which in Purchase's opinion is close to the natural summit of point B. The same map gives a tiny 270m contour at point C partially obscured by the name Bananimma (which does not appear on the current D28 map), and a 270m spot at point A, the source of the TACit data. However Purchase was convinced from ground observations that the latter height is incorrect. The current D28 map shows just a 260m contour at point A. The 19th century 1:10560 map gives an 884ft trig at point A, which converts to 266.7m when adjusted to the Malin Head datum. This map also gives a 886ft trig (267.4m) at point C labelled Bunnamimma, whereas the 1:2500 map, which has a more modern appearance, gives 888ft (268.0m) and the name Bananimma. Neither imperial map gives a height for point B.

We have agreed with MountainViews a relocation to point C, with adoption of the name Bunnamimma and 268m for the summit height.

### **Alderney Airport, NE perimeter (7816, 57)**

The 1966 1:10560 map (still available) gives two 294ft spot heights near the eastern and western edges of a wide 290ft contour. The eastern spot, named "Le Ronde But" (Le Ronde Butt on the States of Guernsey Official Map) also appears on the Admiralty chart. The other 294ft spot is 350m west near Le Callier. There is a much smaller 290ft contour NE of the airport runways that corresponds to the small 90m contour on the States of Guernsey Official Map. This is the location we give in the database. The States of Guernsey Official Map gives no other 90m contour, and only an 85m contour encircling the other locations. Note that the 1:12500 International Travel Map uses the [old UTM30 grid](#), as does the 1:10560 map.

The States of Guernsey Official Map (2010) has no spot heights.

### **Les Platons, Jersey (7817, 57)**

Our data are taken from the 1969 Directorate of Military Survey map, which shows a 446ft spot at Les Platons labelled "Highest Point". This location is also claimed to be the highest in Jersey in current tourist literature, including a cycling map. The Ordnance Survey published an Official Leisure map in 1981 based mainly on earlier surveys (not by the OS) supplemented by aerial photography flown by the OS in April 1980. The 1981 map has no "highest point" but spot heights make it clear that the location described is >435ft. The current 1:25000 Official Leisure Map of Jersey (revised 2011) gives a height of 134m on La Rue des Platons to the south.

Both imperial maps show a 460ft contour ring NE of Les Platons centred at WV658560 on the old UTM grid system. The current map has a 140m contour here, centred on WV657557 on the new UTM30 grid. The 1969 map gives a spot height of 376ft (115m) within this contour; the other maps have just the contour ring. However the 1969 map has colour-coded topographical shading and there is only one 400ft contour on Jersey. Within that contour, the next highest spot after Les Platons is 436.7ft at WV662553. It seems clear that that the 460ft/140m contour is actually 360ft/110m and a labelling error in the early map has been propagated in modern maps. This may be the source of the 143m "unnamed location" quoted in the CIA World Factbook and reproduced in other web pages, which some articles have subsequently associated with Les Platons.

### **The Access database**

The Access database, which can be used with Access 2000 or any later version, has a fully relational

structure. You do not need to own a copy of Microsoft Access in order to use the database, as you can install a free runtime version. See [downloads](#) for instructions. There is small loss of functionality in Access 2000.

The Hills table is at the core of the database. Classification (hill list) and Area information are in separate tables, with "link" tables to identify the Classes and Areas to which a hill belongs.

You do not have to be knowledgeable about relational databases to use it. Viewing hill data, and logging your ascents, are simplified by the provision of a number of forms and screens.

The Userlog facility allows you to record date climbed and other details of the ascent. There is a User table that allows multiple users to share the same copy of the database, each maintaining separate logs. Users pursuing second or subsequent rounds will find it helpful to assign separate user names to each round in order to monitor their totals for the repeat rounds.

On opening the database you are presented with a Welcome screen, which is the start point for all the facilities provided by the database. It provides the following options.

- Hills Database: This is the main screen for searching the database and logging personal ascents.
- User Totals: Provides a summary of your progress against all the popular hill lists in Britain. You can view totals for two users at the same time, side by side.
- User Progress: Provides a breakdown by year, or by month, of the number of hills you have climbed.
- User Compare: List hills climbed by one user but not by another, or hills climbed by both, or hills climbed by neither.
- User Logs: View your complete set of logs, in descending order of date climbed.
- User Details: Change your User name, or add additional Users to the database.
- Import Logs: Quickly import your logs from an earlier version of the database, or using a CSV extract of your logs from Hill Bagging. This function does not work in Access 2000, but you can copy and paste your records from a previous version of Access as follows. Open the "Userlog" table in your previous version, select all four columns, right click to bring up the menu and Copy. Then open the same table in the new version, select the columns and Paste.
- Export Logs: Create a CSV file of your logs, which can be opened in a spreadsheet such as Excel or imported to [Hill Bagging](#). If importing to Hill Bagging, be sure to change the date format to yyyy-mm-dd.

If you have closed the Welcome screen, it can be accessed from the Forms menu.

## Uploading grid references to a GPS

Later GPS devices connect to a computer via a USB cable and are displayed as a drive in the computer's directory tree. These models include Garmin eTrex 10, 20, 30 and the Oregon and Montana series.

Older devices, e.g. the earlier eTrex models, connect to a computer via a com port. A USB conversion cable can be purchased, but some users have reported difficulty in getting it to function.

Grid references are uploaded to the two types of instrument in different ways.

## Uploading grid references to later models

Ten-figure grid references of all hills are available in a Point of Interest (POI) file accessed on the downloads page or from a query in the Access database. Bernie Hughes' file contains all British hills in the database. The facility on Hill Bagging allows the user to select a subset of hills meeting particular criteria. The latter has a "long" version that includes all the key fields in the database (as does Bernie Hughes' file), and a "short" version that has only the location, hill name and height. The "POI csv extract" query in the Access database (accessible from the *Queries* menu) returns the "long" version.

Connect your GPS to your PC. Create a subfolder named POI in the Garmin folder of the GPS and copy the file into it. No further action is needed for Bernie Hughes' file as it is already in gpi format. If you created the file in Hill Bagging or Access, save it as filename.csv (rather than .txt) and upload it to your Garmin device using [Garmin POI Loader](#). NB. Do not use numeric characters in your filename – they will cause speed/proximity alerts to be added to your POI.

Disconnect the GPS from the PC and switch it on. You might have to experiment to learn how to display all the data in the POI file. On a Garmin eTrex 20 the process is as follows (Click means push down on toggle switch):

1. Where to? Click.
2. Extras. Click.
3. Choose relevant database e.g. Hills. Highlight and Click.
4. Highlight required hill. Click.

You will now have a screen with the name of the hill at the top, map in centre and Go button at bottom.

5. Push toggle upwards and Go will disappear.
6. Click and hill data should now appear with Go button reinstated on screen.

For the models listed above the screen will display all the hill details in the POI file, viz. name, height, ten-figure grid reference, hill number, classification, feature, and (depending on the file) other fields such as climbed date, drop, map, observations, survey and comment fields. The fields following the name, height and ten-figure grid reference are combined and presented in the Comment box of the instrument. Note that some earlier models with USB connectivity (not in the list above) do not have a Comment box and therefore do not display this information. The "short" version obtained from Hill Bagging is suitable for those. We would be grateful for information on other models.

For hills where no ten-figure grid reference has been recorded, the grid reference is for the SW corner of the 100m square in which the summit is thought to reside and consequently the GPS will not take you to the summit itself. These hills are easily identified in instruments where a Comment box is displayed because such hills lack a feature, observation and survey entry.

Waypoints may be uploaded to the GPS via a GPS exchange (gpx) file. This can be created using the facility on Hill Bagging mentioned above (link on Downloads page). Alternatively, it can be created in GPS Utility by a similar method to that described below, i.e. by creating a text file from a csv file using GPSU File Converter, opening it in GPS Utility and then saving it as a gpx file. The file may then be copied to the GPX subfolder in the Garmin directory of the GPS.

## Uploading grid references to early models

Grid references from the database can be uploaded to a GPS unit using appropriate software. We have evaluated two packages: [GPS Utility](#) and [G7toWin](#). The free version of GPS Utility has limitations on capacity which can be removed by registering for a modest charge. G7toWin is freeware. We have not evaluated commercial packages such as Anquet Maps and Memory Map.

### Instructions for GPS Utility

Download both *GPS Utility* and *GPSU File Converter*. The latter converts files with a csv extension to text files that open in GPS Utility. The steps involved in the process of uploading a file to a GPS are as follows.

1. Create the appropriate csv file for the data you wish to upload. We have provided a small csv [test file](#) with some British hill data for test and set-up purposes
2. Open the csv file in GPSU File Converter and save this as a text file
3. Open the text file in GPS Utility and transfer the data to the GPS.

The following describes the process in more detail for a Garmin eTrex. We have also successfully uploaded files to a Garmin eTrex Venture and a Garmin GPSMAP 60c. Both GPS Utility and GPSU File Converter have excellent and extensive Help files.

### Setting up GPSU File Converter

Open the application and enter the following information:

1. In 'Convert to' select Waypoints
2. In 'Waypoint Settings' select Garmin(2-byte) for 'Symbol Set Type' and choose Comment in 'Text Option'
3. Under 'Grid' and 'Datum' select the following:
  - for Great Britain, British Grid and Ord Srvy Grt Britn
  - for Ireland, Irish Grid and Ireland 1965
  - for Channel Islands, UTM and WGS84
4. Note that you can choose to ignore the first line of a data set. This is useful when a file contains headers, e.g. our test file
5. Right-click on the first column header and from the drop-down list select ID

6. Right-click on the second column header and from the drop-down list select 'other' and then 'Grid' from the two available options. This tells the software to expect the grid reference in one field rather than split into eastings and northings
7. Right-click on the third column header and from the drop-down list select 'Altitude' and then 'metres' from the three available options
8. Right-click on the fourth column header and from the drop-down list select 'Comment'.

GPSU File Converter should now be able to open the test file. ID is the unique hill number, Grid (Zn E,N) is the ten figure grid reference, Alt(meters) is the height of the hill in metres and Comment is the hill name. Once open, click 'Export aS' and save as a text file.

### Setting up GPS Utility

1. Open GPS Utility
2. Under 'GPS' in the main menu select 'Set-up' from the drop-down list
3. In the Interface Setup dialogue box that opens:
  - for 'GPS make/Interface mode' select Garmin(Serial;USB/Serial)
  - for 'Type/Family' select eTrex
  - for 'Model' select generic
  - for 'Com Port Number' confirm that the com port to which your GPS is connected is selected
4. Under 'Options' in the main menu, select 'Grids' and ensure British grid and/or Irish Grid are available
5. Under 'View' in the main menu, select 'Datum' and choose Ord Srvy Grt Britn, Ireland 1965 or WGS84 for Great Britain, Ireland and Channel Islands respectively
6. Still under 'View' in the main menu, select 'Coordinate System' and choose British Grid, Irish Grid or UTM/USP for Great Britain, Ireland and Channel Islands respectively

GPS Utility should now open the text version of our test file that you have just created in GPSU File Converter. If you wish to upload all of the grid references to your GPS select 'upload all', otherwise select those you wish to upload and then select 'upload Highlighted all'. The grid references will then be uploaded to your GPS.

Note that it is the unique Hill Number that is transferred to the GPS in our test file and not the Hill Name. The earlier eTrex models only accept six characters for a waypoint name and most hill names are much longer than this. Unique Hill Numbers do not exceed six characters in length. When starting a walk, the appropriate Hill Number will be visible in MapView (when set to the appropriate scale) on the eTrex and the user will be able to identify the correct hill to select in GOTO when approaching the summit area. We have uploaded a dataset of twenty hills to a Garmin eTrex and successfully navigated to all of them in this way. Whilst the hill name is a useful identifier in the csv file, it is not necessary once the whole dataset is in the GPS. However if the user prefers to abbreviate hill names and use these as the ID, this is easily accommodated by GPS Utility.

GPS Utility (GPSU) text files can also be created in [Hill Bagging](#).

The ten-figure grid references in the database will usually take the user to within 5m of the target feature. The database is available in csv format from the [downloads](#) page, while user-specified subsets can be created by the [Hill Bagging](#) website to registered users. We recommend you use one of these versions to create the files for uploading to your GPS.

We are grateful to Darren Parker who first kindled our interest in uploading ten-figure grid references from the database to a GPS instrument, and to Bernie Hughes for first creating POI files from the database.

### Recreating the original lists

Microsoft Access users can easily extract individual lists, including subsets, using the search facility. Users of the Excel or text versions of the database can recreate many of the original lists, approximately, by sorting on the relevant category field followed by Area (for Donalds, Nuttalls and Wainwrights) or Section (for *The Relative Hills of Britain* and TACit Tables – note the earlier publications do not subdivide sections 5, 6, 8 and 26). In Excel, the easiest way of selecting hills belonging to a particular category is to use the *Autofilter* facility in the *Data* menu. This is already set up in the file.

For Marilyn's and Grahams, the hill order in RHB/TACit can be reproduced approximately by further sorting by descending height.



## User feedback and database enhancements

We welcome users' suggestions for enhancing the database, and of course reports of errors.

We are particularly keen to receive 10 figure GPS measurements on less popular hills. Please see under [10 Figure Grid References](#) for the information we need.

## The DoBIH Fund

The DoBIH Fund was set up in response to offers from a number of users to contribute to the costs of maintaining the database. It was originally named the Survey Fund and used to support our surveying activity, but is now used for other purposes too. The fund is managed by John Barnard and Graham Jackson.

Hill surveying using cutting edge techniques was pioneered by two DoBIH editors as a means of gaining accurate data on hills where height, drop or location are critical. Surveys by the survey team (G&J Surveys) are carried out to professional standards and, subject to validation, data is accepted by Ordnance Survey as it is collected to OS protocols. Hills where OS has adopted new summit heights supplied by the team include Sgurr nan Ceannaichean, Beinn a' Chlaidheimh, Beinn Dearg Mor, Knight's Peak, Carn na Caim South Top, Creag na Caillich, Cnoc Coinnich, Glyder Fawr, Tryfan, Mynydd Graig Goch, Calf Top, Thack Moor and many others.

The team has access to a Leica GS15 survey-grade GPS capable of measuring height to 5cm, a Leica NA730 automatic x30 telescopic level, two Leica Runner automatic x20 telescopic levels, two 1m surveyor's staffs extendable to 5m, four tripods and a Leica Disto A8 for measuring distances and angles. This suite of equipment enables them to determine absolute height and drop, usually to 0.1m or better, in almost any terrain.

Anyone wishing to support the fund can do so via the [PayPal link](#) or by contacting one of the editors. We have received a number of donations from supporters and are very grateful to everyone who has helped us.

## Acknowledgements

We thank Alan Dawson for many hundreds of survey measurements, contributions to data revision, and constructive suggestions; Joe Nuttall for topographical analyses of LIDAR and OS digital data which identified over a thousand potential changes for investigation; Mark Jackson for his contribution while an editor of the DoBIH, particularly his work on the Scottish 500s and subs; Rob Woodall for files posted on the Yahoo rhb group in the 2000s and particularly his work on the British 500m hills; David Purchase for his work on the Donald Deweys and Channel Islands hills and much help with the Dewey change register; Simon Stewart and John Fitzgerald of MountainViews for Irish survey data; Myrddyn Phillips for some survey measurements; Geoff Crowder, Andrew Tibbetts, Bernie Hughes, Martin Hampar, John Kirk, Gordon Adshead, David White and Tony Hartry for providing or reviewing hill lists and data; Toby Thurston for supplying the boundary coordinates of Landranger and Explorer maps; all those who responded to the user surveys in 2008, 2010 and 2018; and many other correspondents who reported errors and suggested improvements.

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*Updated 10 May 2023*

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