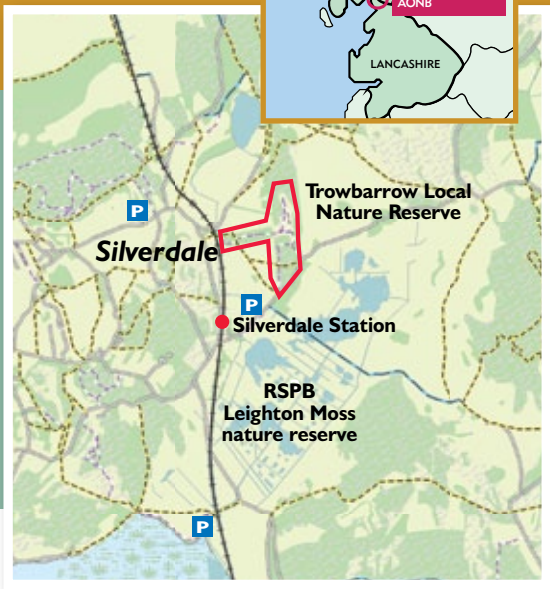




How to get to Trowbarrow Local Nature Reserve

Trowbarrow Local Nature Reserve is easily accessible by public transport. Silverdale Station, on the Manchester/Preston to Barrow line, is only 500 metres from the reserve. There is also a regular bus service between Carnforth and Silverdale village, with the nearest bus-stop being opposite the entrance to RSPB Leighton Moss Visitor Centre, just a few minutes' walk away.



For information on rail services, contact National Rail Enquiries on 08457 484950 or visit www.nationalrail.co.uk

For information on bus services, contact Traveline on 0871 200 2233 or visit www.traveline.org.uk

There is limited road side parking near to the footpath entrances to Trowbarrow on Storrs Lane.

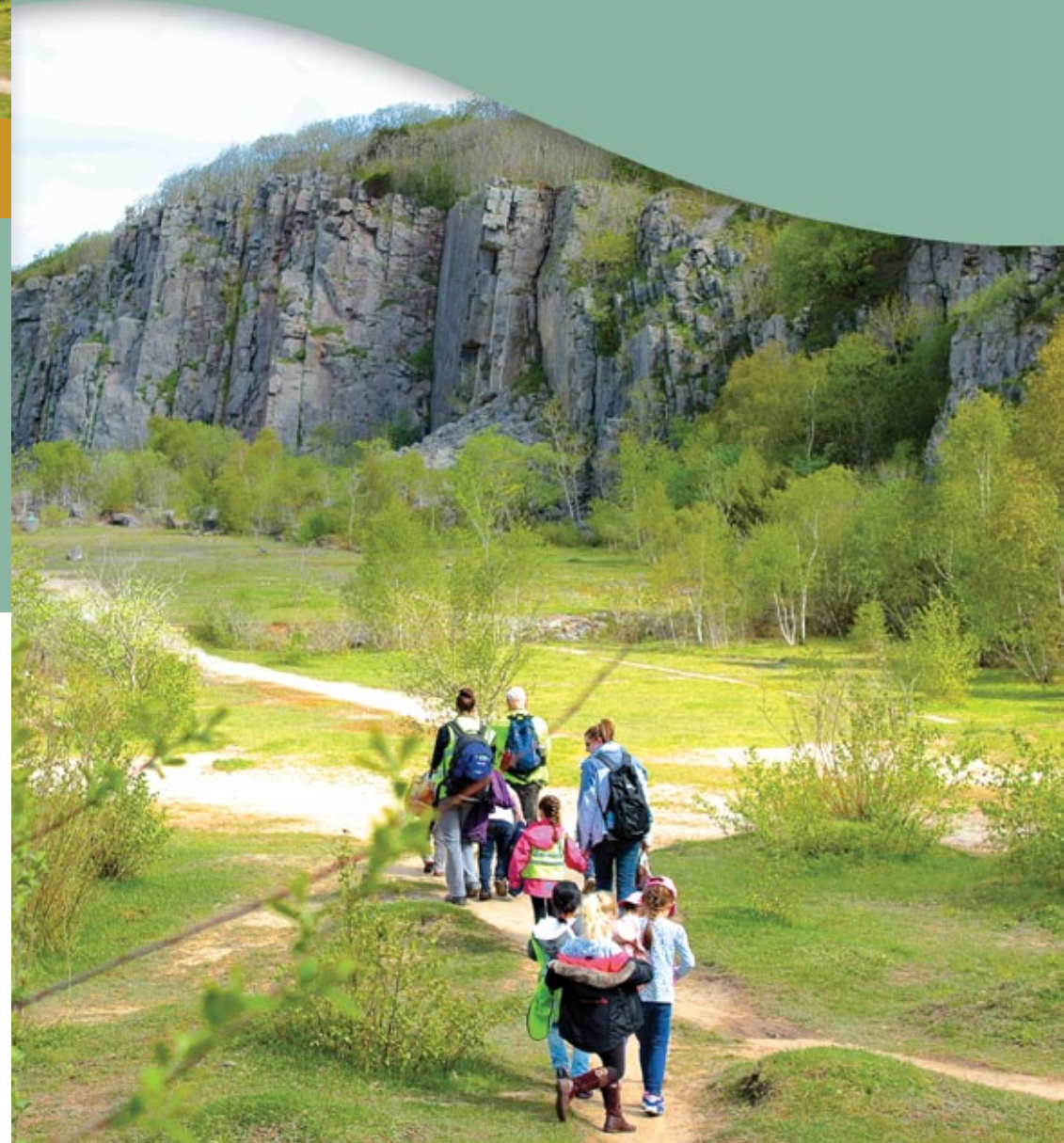
Arnsdale & Silverdale AONB
Old Station Building, Arnsdale, Carnforth, LA5 0HG.
Tel: 01524 761034
E: info@arnsidesilverdaleaonb.org.uk
www.arnsidesilverdaleaonb.org.uk

Photo Credits: Phillip Tomkinson, Mike Hutton, Neil Foster, Jon Sparks, RSPB Images, Martin Shaw, Northestwildlife.co.uk, Steve Bullen, Simon Hawtin, John Jenkins, Alan Barnes, Jon Barber, David Talbot, Peter Last, Paul Baker, Art-image, Tony Riden.

This leaflet is produced by Arnsdale & Silverdale AONB on behalf of Lancaster City Council.



A Guide to Trowbarrow Local Nature Reserve



Leaflet design by Capra Design, Kendal. Printed on paper from a sustainable source

Welcome to Trowbarrow Local Nature Reserve

Trowbarrow Local Nature Reserve (LNR) is owned by Lancaster City Council and is a geological Site of Special Scientific Interest (SSSI).

Once a limestone quarry, it is now managed as a nature reserve and for quiet recreation.

In addition to the many important geological features and interesting rock formations, the site offers a rich mosaic of wildlife habitats supporting a wide range of plants and animals.

Look out for...

- limestone geological features and limestone sea coral and trace fossils;
- quarry floor early plant succession and colonisation, with many limestone grassland species, including orchid plants and mining insects;
- wildlife ponds, home to water-beetles, dragonflies and newts; and
- broad-leaved woodland and hazel coppice with violets and other woodland plants.



Northern Brown Argus



Common Spotted Orchid



Chiff-chaff

Did you know...?

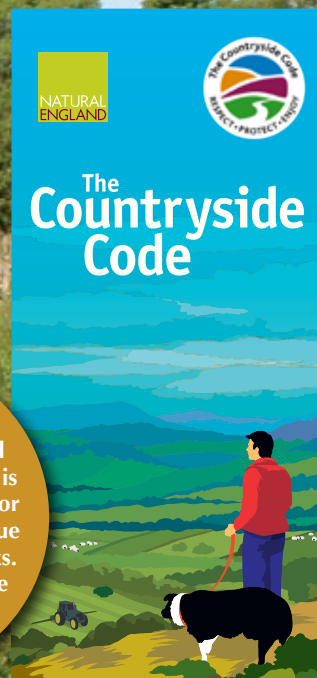
- Trowbarrow is a small limestone hill, reaching 65 metres high, rising between the low-lying wetland habitats of RSPB Leighton Moss Nature Reserve and Hawes Water meadows;
- Trowbarrow is derived from two Anglo-Saxon words - **trōw** meaning trough and **barrow** meaning hill;
- during its industrial era, the quarry pioneered the production of tarmacadam;
- Trowbarrow, owned by Lancaster City Council, is designated a Local Nature Reserve and is managed by the Arnsdale & Silverdale Area of Outstanding Natural Beauty Team.

Common Twayblade



DANGER

The high rock faces and cliffs are unstable and it is unsafe to stand beneath or close to the rock faces due to the risk of falling rocks. Anyone entering the site does so at their own risk.



The Countryside Code

Respect. Protect. Enjoy

Respect other people

- Consider the local community and other people enjoying the outdoors
- Leave gates and property as you find them and follow paths unless wider access is available

Protect the natural environment

- Leave no trace of your visit and take your litter home
- Keep dogs under effective control

Enjoy the outdoors

- Plan ahead and be prepared
- Follow advice and local signs



Green Tiger Beetle

History

Until 1857, Trowbarrow stood as a small wooded hill, with Ash, Hazel and Yew woodland growing over mossy limestone blocks, but all changed with the arrival of the Carnforth to Ulverston railway. The line ran just west of Trowbarrow and with these improved transport links, the site became a viable commercial operation for quarrying.



The quarry produced lime for building, industry and agriculture and for most of its 100 year productive life, was worked entirely by hand.

Between 20 to 30 local men worked at the quarry at any one time. Holes were drilled by hand into the cliff faces and packed with gunpowder. The large lumps of blasted rock were then broken up using picks, sledgehammers, bars and chisels and loaded on to wagons. A tramway and incline alongside Lime Works Wood transported the limestone from the quarry down to the quarry buildings for processing or onward transportation via the railway.

The quarry buildings which used to stand next to the railway line would have included a Hoffman lime-kiln, storage hoppers and a crushing plant and it was here that a new process of mixing crushed limestone with bitumen tar was pioneered. The result was tarmacadam, originally marketed as 'Quarrite – the new dustless paving'.



The quarry closed in 1959, although tarmacadam production continued for a few more years using stone from nearby quarries. It wasn't until 1997 that it became a Local Nature Reserve but in just a few years, a rich and diverse flora has colonised

the quarry floor; butterflies, birds and bats have returned to the site and surrounding woodland; and climbers have discovered a challenging rock face, with around 120 rock climbs of varying difficulty.



Shelter stone

Did you know...?

- the large stone on the quarry floor is known as the 'shelter stone.' Quarry workers sheltered here during blasting.
- if limestone is heated strongly, it breaks down to form calcium oxide (also known as quicklime) and carbon dioxide. Slaked lime, suitable for use as an agricultural fertiliser or in cement, is produced by adding water to the quicklime.

Geology - The story of the rocks

Man's intervention by quarrying the hillside has exposed the dramatic geological formation of Trowbarrow and led to its designation as a Site of Special Scientific Interest (SSSI).

The main rock type in the quarry is limestone although there are also thin layers of clays and mudstone.

About 330 million years ago, during the Carboniferous period, in warm, shallow, tropical seas, marine sediments were deposited in layers. These sediments, composed of broken fragments of shells, crinoid (sea lily) stems, corals and algae, became compressed to form limestone rock, which when subsequently exposed, was eroded by ice and dissolved by rainwater to create the distinctive geological features we see today.

There are three different types of limestone found in Trowbarrow

- Urswick Limestone dominates the quarry. It is a strong rock with well-defined bedding planes and would have made up most of the quarried stone;
- the youngest, most recently formed, is called the Gleaston Group and can be found toward the eastern margin of the quarry;
- Park Limestone is the oldest and weakest and breaks up easily to form scree. It is found on the sloping ground to the west of the quarry through Lime Works Wood.

The limestone here is locally distinctive as the bedding planes, normally horizontal or inclined, are vertical, forming unusual flat slabs of rock on the quarry face.



Upper Urswick Limestone to left and fragmented Park Limestone to right

A linear rock formation, The Trough, runs in a north-south direction adjacent to the western boundary. This is a natural trench formed by the erosion of a soft layer of shale between two resistant limestone strata. The shale forming the floor of the Trough is particularly rich in fossils.

Complete fossils are relatively rare, but there are numerous examples of trace fossils on the bedding planes. These trace fossils record the activities of burrowing organisms such as shellfish or worms. As they burrowed they ate the sediment, extracted food and excreted the inedible part behind them. It is these burrow fillings of excreted material that have been preserved as cylindrical sticks that cover the rock face.



The Trough



Fossilised sea coral

Other fossils found here include colonial corals that have been preserved in the position in which they grew. Look out for round structures, around 30cm across, which look like wheels with radiating spokes.

Fossil collection and use of hammers on the rock is not permitted.



Stick coral

Colonial coral

Habitats

- special places for plants and animals



Juvenile Woodmouse



Orange Ladybirds



Pixie-cup lichen

Since quarrying activities stopped in 1959, nature and wildlife have gradually recolonised the site and a blend of different habitats has developed, supporting a wide range of plants and animals.

Woodland

Trowbarrow has a rich and diverse cover of woodland, ranging from early colonisation of Birch and Willow scrub around the quarry floor; to Hazel coppice with standard Oak in Lime Works Wood; to the Sycamore plantation of East Plantation; and to the ancient semi-natural broad-leaved woodland of Storrs Lane Wood.

The predominant species is Common Ash, but there are a good number of other species such as Wych Elm, Yew and Sessile Oak.

The under-storey includes a good variety of smaller trees and shrubs, including Juniper, Purging Buckthorn, Crab Apple, Guelder Rose, Holly and Hazel.

Look out for...

- woodland wildflowers and plants such as Common Violet and Broad-leaved Helleborine;
- butterflies such as Speckled Wood, Brimstone and White-letter Hairstreak and the day-flying moth, Orange Underwing.



Common Violet



Speckled Wood



Broad-leaved Helleborine

Look out for...

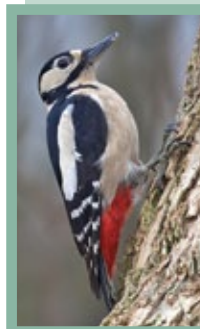
- the many bird species that nest in the woodlands and woodland edges, including Marsh Tit, Bullfinch, Nuthatch, Greater Spotted Woodpecker, Jay, Blackcap and Chiff-chaff;
- Roe Deer which also frequent the woodland.



Nuthatch



Marsh Tit



Greater Spotted Woodpecker



Blackcap

Deadwood Habitat

Deadwood habitat is an important ecological element of a healthy woodland. Deadwood is a crucial part of the recycling of minerals and elements as the rotting wood decomposes, giving a niche for a succession of fungi and micro-organisms, and a whole host of invertebrates and beetles and their larvae. These in turn provide food to support small mammals and birds.

It is important that all deadwood is left in a woodland for these reasons and the Forestry Commission encourages all woodland owners to leave deadwood habitat, both standing and laying, on the woodland floor to ensure optimum biodiversity and a healthily functioning woodland habitat.

Veteran Ash tree



Orange Underwing



May Bug

Habitats

- special places for plants and animals



Rockrose



Solitary Mining Bee



Common Centaury

Quarry Floor

Large areas of the quarry floor remain bare stony ground, a specialised habitat favouring a number of species, such as mosses, lichens and flowering plants that prefer impoverished conditions. Nearby mounds of fine limestone marl dust, left over from quarrying activity, provide ideal habitat and nesting burrows for a number of small insects and burrowing creatures. Rabbit burrows are often used by nesting Shelduck in the springtime.

A certain amount of low level disturbance is needed to maintain these areas.



Cyclists are allowed to use the site but digging and making new jumps is not permitted

Look out for...

- wildflowers such as Bird's-foot Trefoil, Cat's-ear Hawkweed, Wild Strawberry, Rockrose, Eyebright, Fairy Flax, Tway-blade, Fly Orchid, Common Spotted Orchid, Bee Orchid, Common Centaury
- insects such as Green Tiger Beetle, Solitary Mining Bee and solitary digging wasps.



Solitary Digging Wasp



Eyebright



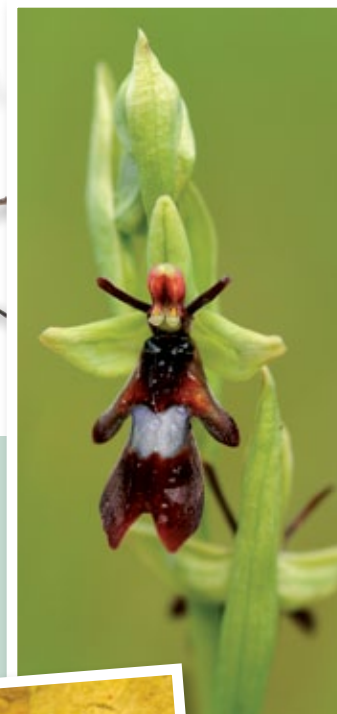
Bee Orchid

Freshwater Pools

Paths and access tracks are prone to erosion, particularly after heavy rainfall. To prevent this erosion and to gain a freshwater habitat on the quarry floor, a small number of shallow pools have been created. These provide breeding habitat for a number of aquatic species.



Green Tiger Beetle



Fly Orchid

Look out for...

- wetland plants such as Reedmace and rushes;
- aquatic creatures such as Pond Skater, water beetles, damselfly, darter and dragonfly species and;
- Palmate Newt.



Female Common Darter



Palmate Newt

Habitats

- special places for plants and animals



Cocks Foot Grass



Blue Moor Grass

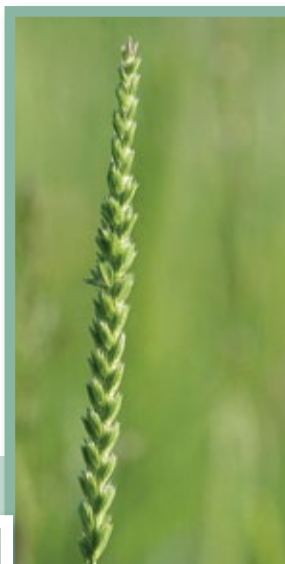


Tawny Owl

Limestone Grassland

Areas of limestone grassland have developed around the edges of the quarry floor. Here you can find a number of different species of grass, including Blue Moor Grass, fine-leaved fescues, Crested Dogs-tail and Quaking Grass as well as many different species of wildflower.

The nectar-providing wildflowers and foliage attract several species of Bumble Bee and butterfly and over 60 species of moths have been recorded here.



Crested Dogs-tail

Look out for...

- butterflies such as Common Blue, Northern Brown Argus, Small Heath, Dingy Skipper.



Common Blue



Dingy Skipper



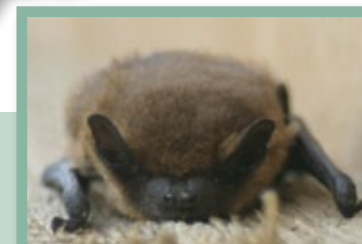
Small Heath

Cliffs and Rock Faces

The taller cliffs and rock faces provide perching, roosting and nesting sites for a large colony of Jackdaw. Birds of prey, including Kestrel, Sparrowhawk, Buzzard, Tawny Owl and occasionally Peregrine, also frequent the quarry faces and bats can be found roosting in the rock crevices.



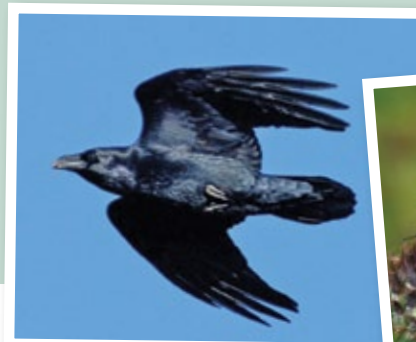
Kestrel



Pipistrelle bat

Listen out for...

- the deep croaking and clonking calls of the Raven.



Raven



Female Common Darter



Buzzard

Management

of the Local Nature Reserve

Trowbarrow is managed for its special limestone habitats, plants and wildlife by the Arnside & Silverdale AONB Team on behalf of Lancaster City Council.

A site management plan is in place and an Advisory Group meets twice a year to review the management work required. The plan is available to view at www.arnsidesilverdaleaonb.org.uk

A great deal of woodland management work has recently been made possible through an English Woodland Improvement Grant from the Forestry Commission. This work has included felling selected standard trees and getting the Hazel coppice back into a good renewable cycle. Such woodland work is always carried out during the winter months to avoid the bird-nesting and wildflower seasons.

Coppicing is the traditional way of managing woodlands. Each year small areas of woodland are cut back on a rotational basis. These re-grow with vigour the following year providing healthy and diverse habitat. In the most recently coppiced areas the ground flora responds quickly with a flush of wildflowers. Coppicing also benefits breeding song-birds, especially warblers such as Whitethroat, Blackcap and Garden Warbler.

The grassland and woodland-edge habitats of Trowbarrow provide breeding sites for many species of butterflies and moths. Many of the special plants are valuable as food plants for butterflies and moth species and their caterpillars. The habitat is managed in order to maintain ideal conditions for them.



Greater Spotted Woodpecker with juvenile



Woodland coppice and re-growth



Please do not disturb the boxes as this may cause the birds/bats to abandon the nest.

Look out for...

- different stages in the coppice re-growth and see how the character of the woodland and its ground flora changes and rejuvenates under this traditional management regime;
- hundreds of bird-boxes and bat-boxes which have been put up around the site to increase the bird nesting and bat-roost options. These are checked and monitored by licenced volunteers.

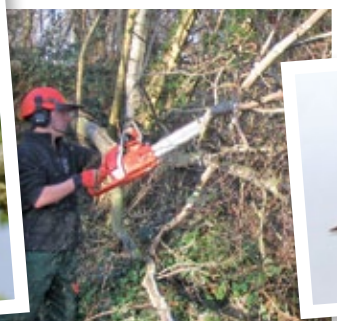
Forest School educational visits can be arranged by contacting the AONB Team (contact details on back page).

Short periods of grazing by a couple of ponies during late autumn-early winter also help maintain the grassland and herb habitat, control the invasion of woody species and importantly remove the dead herb-layer each year, resulting in greater richness and diversity of wildflowers and herbs. The horse droppings provide a habitat for many invertebrates and fungi, without enriching the soil too much.

Trowbarrow is one of the many sites in the Arnside & Silverdale AONB where butterfly surveys are carried out each week between April and October. The data is fed into the national monitoring scheme run by Butterfly Conservation and it is through this monitoring that Arnside & Silverdale AONB has been recognised as one of the most important breeding sites for many species of butterfly, including the nationally rare High Brown Fritillary.



Garden Warbler



Woodland management



Whitethroat

Be aware

You should be aware of the possibility of picking up tiny deer-ticks in warm weather. Check for them and remove them.

For further information, a 'Tick' advisory leaflet is available from the AONB office or website.

Avoid sitting on grass, particularly in warm weather in late July and August, when harvest-mite can cause irritation. These can be washed off once home, or if irritation persists, visit your local pharmacist for further advice.



Climbing

Trowbarrow has around 120 traditional climbs and bouldering routes and with so much variety in the rock there is something for all climbers, from beginner to expert.



Climbers need to be properly equipped and all climbs are undertaken at the climber's own risk.

The following guidelines have been agreed with the British Mountaineering Council (BMC):

- There should be no abseiling, top-roping or lowering-off the Main Wall - climbers should walk down after completing routes. This arrangement is to protect geological features on the face which are part of a geological SSSI designation;
- organised climbing groups are not permitted in the quarry;
- there should be no bolts placed in the quarry;
- camping and the lighting of fires are not permitted

Thank you for supporting these access arrangements.



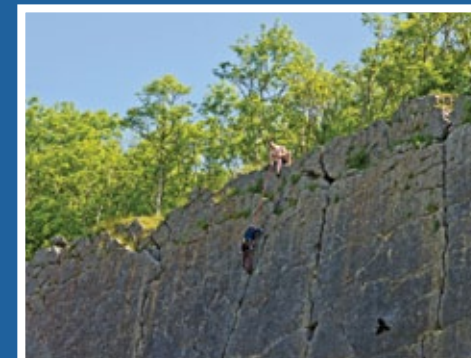
BMC

For further details on the climbing routes, refer to the *Lancashire Area BMC Climbing Guide* due to be published in 2016, which has a 10 page feature about climbing in Trowbarrow

Climbers use a grading system to give an indication of how hard a climb is. As equipment and standards have changed over the years, so the grading system has been extended. The current system runs from Easy, which is more of a scramble, to E11, which has been barely climbed. At Trowbarrow, the hardest climb is currently Diary of a Sane Man (E7).

Did you know...?

- David Bowie songs have been the inspiration for naming some of the climbs in Trowbarrow.



Grade	Climb	Area
Severe	Jomo	Ramps Area
Hard Severe	Truffle	Assegai Wall
Very Severe	Jean Jeanie	Main Wall
Hard Very Severe	Rumal and Assegai	Assegai Wall
E1	Aladdinsane	Main Wall
E2	Cracked Actor	Main Wall
E3	Essence of Giraffe	Red Wall
E7	Diary of a Sane Man	Asylum Wall



In recent years, climbing short and very difficult rock challenges, known as 'bouldering' has increased in popularity.

The lower parts of Red Wall and the Shelter Stone have become popular venues for this activity.