ZULU ECOSYSTEMS

Knoydart Estate– Peatland Restoration Phase 1

August 2025

Typical Site Conditions and Treatments

Prepared for
Knoydart Estate / The Knoydart Foundations

Prepared by
Zulu Ecosystems

General overview – artificial drains

Man made drainage

Phase 1 focuses on areas of peatland degraded by man-made drainage, This is sometimes hidden beneath more developed Heath vegetation and deep Molinia but is still functional, creating a draw-down and drain-shadow effect. Block and re-profile these to restore natural flow paths.

Drainage with raised spoil lines

A pronounced spoil ridge is still evident next to some drainage features. These drains are often still active and post blocking and re-profiling it will be important to ensure the spoil lines are lowered to allow natural overland flow.

General overview

Man made drainage

Drainage hidden beneath well-developed vegetation and deep Molinia but still functional. Drain void located by a Knoydart Foundation staff member who is knee deep in a drain channel.

Knoydart foundation staff member knee deep in a drain

Collapsed drain shoulders

Some of the drain function is obscured due to the drain shoulders collapsing over the main void. This bell profile is quite common in peatland drainage and beneath the surface the drain channels are deep and active.

Bell profile drain void hiding a drain c.80cm deep and fast flowing

General overview – former peat cutting sites

Cut banks, beds and drainage

Old cutting sites with metres of peat removed and relic cutting banks are abundant across the site. In some cases, these leave actively eroding peat edges, like hags, with adjacent peat de-watered by the drainage effect. There is also a lowered water table zone adjacent.

Reprofile bare edges, add oblique/cell bunds adjacent to raise water table

Preparatory drainage

It was common to dig drains on lines that would be cut in the future, in some places the mapped drains are related to the cutting process and are along the toe of a shallow cut bank, where cutting had commenced but has not been extensive.

Dam and reprofile adjacent banks

General overview

Complex areas of former peat cutting

Some areas have had such extensive cutting that the peat that remains appears to be in narrow ridges between lowered flat zones. Here active edges should be reprofiled and revegetated and oblique or cell bunding should be used to lift the water table in the lowered areas

Adapt wave damming methods to form long low bunds across low zones

Interspersed cutting and drainage

Some areas are complex with an intimate mix of cutting and drainage. These will be treated using adapted wave damming and zipping techniques to dress edges, block flow and raise water tables.

General overview – erosion feature

Gully complexes

These are small in scale and relatively rare on most of these sites. The worst features are found in Zone 3. These will be treated using standard reprofiling methods in conjunction with peat and turf dams and micro-turf dams.

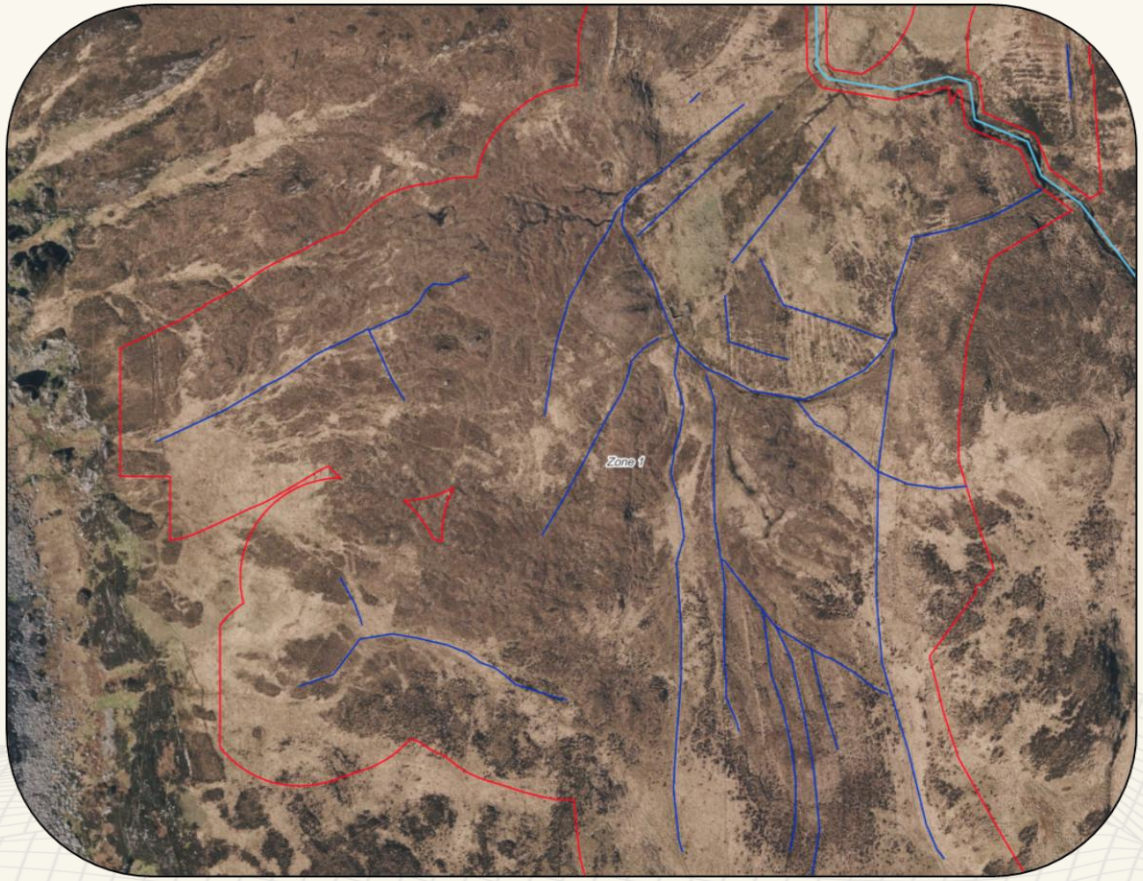
Small gullies and micro erosion

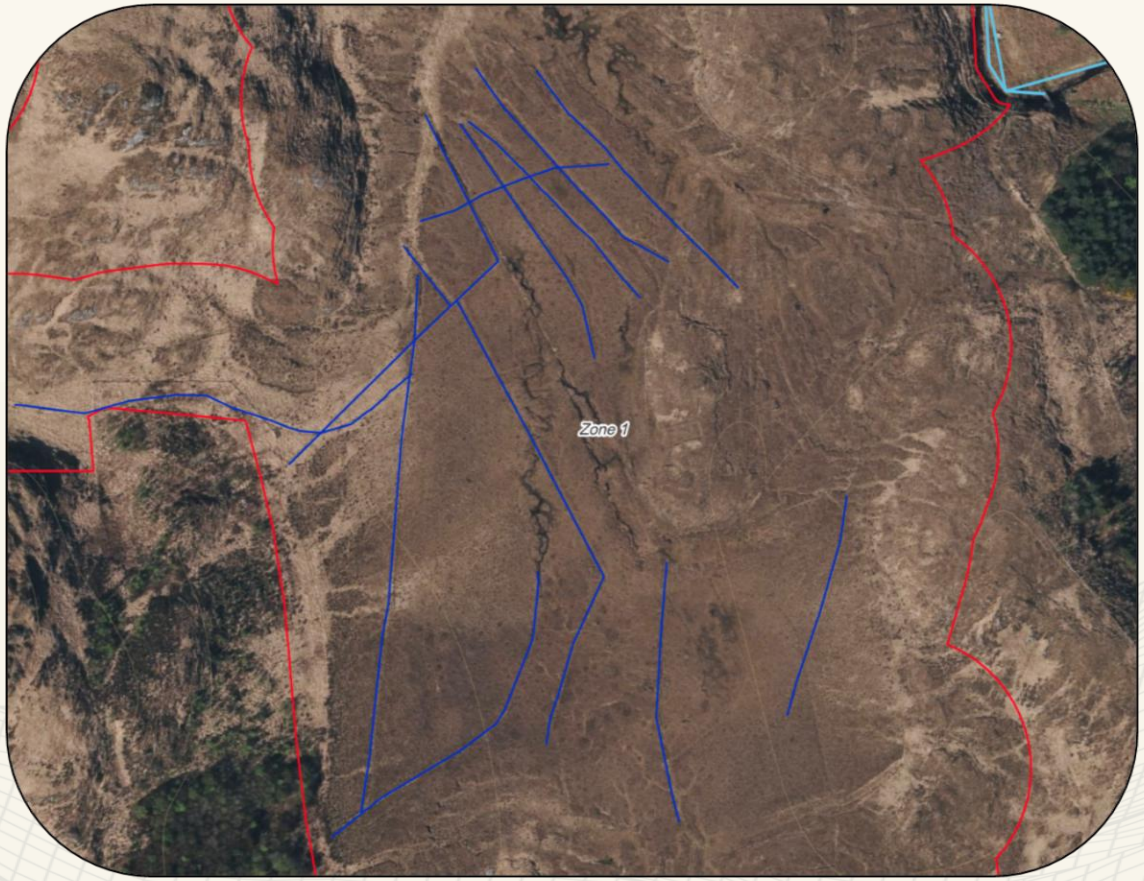
These features will be treated with strategic micro-turf dams and bunds formed using adapted wave damming techniques.

Work Zone 1

This zone has a mixture of drains, cut banks and some very sparse small-scale erosion features. The work zone is split into two distinct areas and accessing between these cross country may require watercourse crossings. There is extensive evidence that the western most part of zone 1 (left image) area was formerly used for agriculture (potentially as far back as the medieval period), with old bunds, shieling boundaries and run-rig cultivation all evident in aerial imagery. Where appropriate these features will have exclusion zones marked around them, so no features of archaeological interest are affected by the drain damming work.

The easternmost part of Zone 1 is within the Sandaig land-holding and has more extensive peat cutting areas associated with this property and other former dwellings nearby.





Work Zone 1- Typical Features

Eroding Pools and areas of active erosion

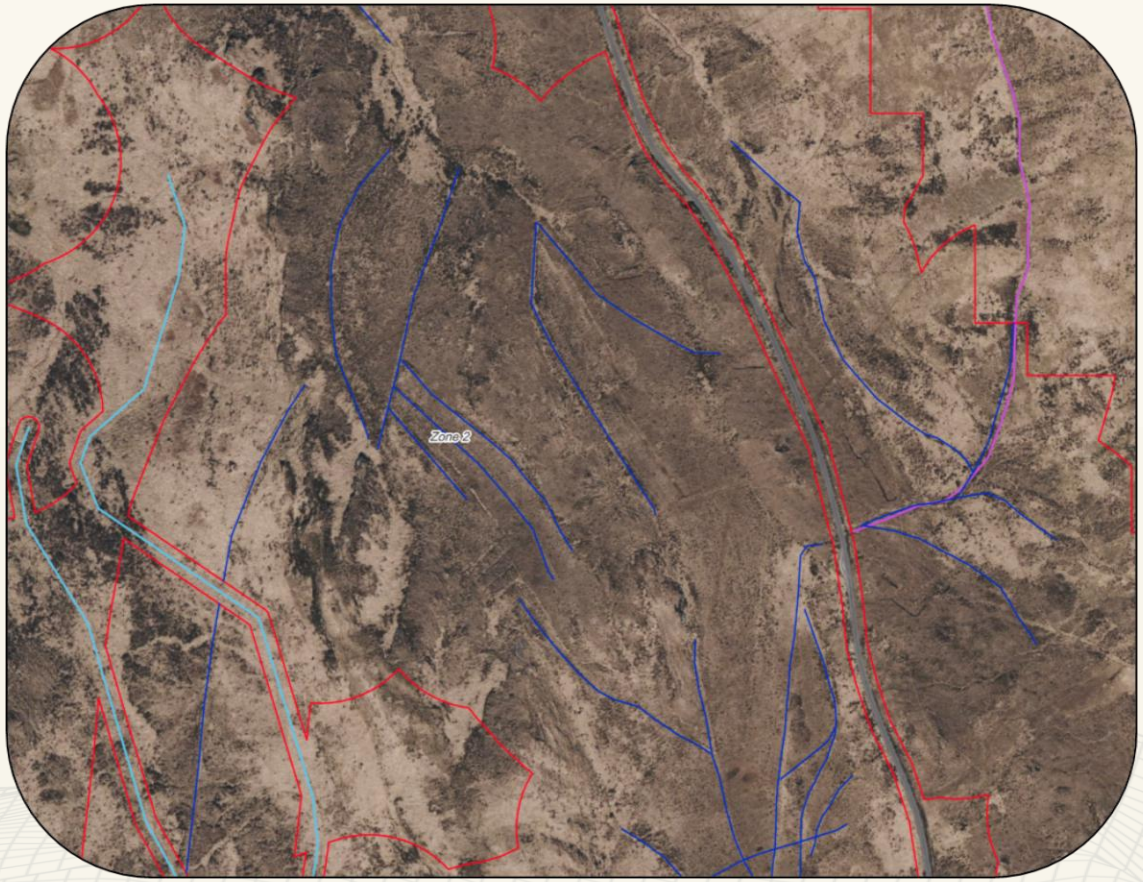
Small scale erosion features - re profile and re-vegetate using undermine and pack reprofiling method, add turf

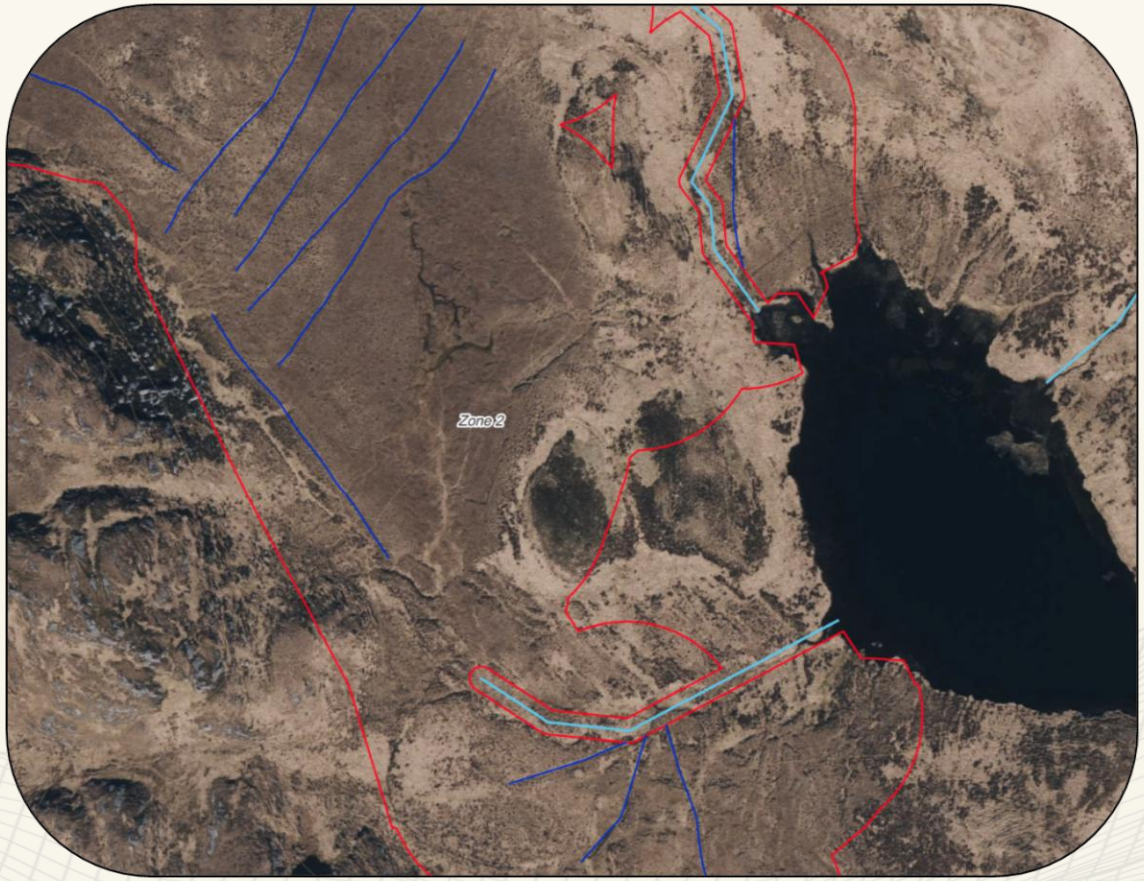
Artificial Drains

Block drains using zippering and wave damming techniques, ensure spoil mounds or lateral bunds adjacent are breached to allow diffuse overland flow

Work Zone 2

This zone is a mixture of drains and cut banks and some very sparse small-scale erosion features. The drains connect into a network of streams that flow into the nearby lochan. Some of the drains are naturally occluding, and warrant a lighter touch intervention, others are very functional but obscured by denser overlying vegetation.





Work Zone 2 - Typical Features

Cut Banks

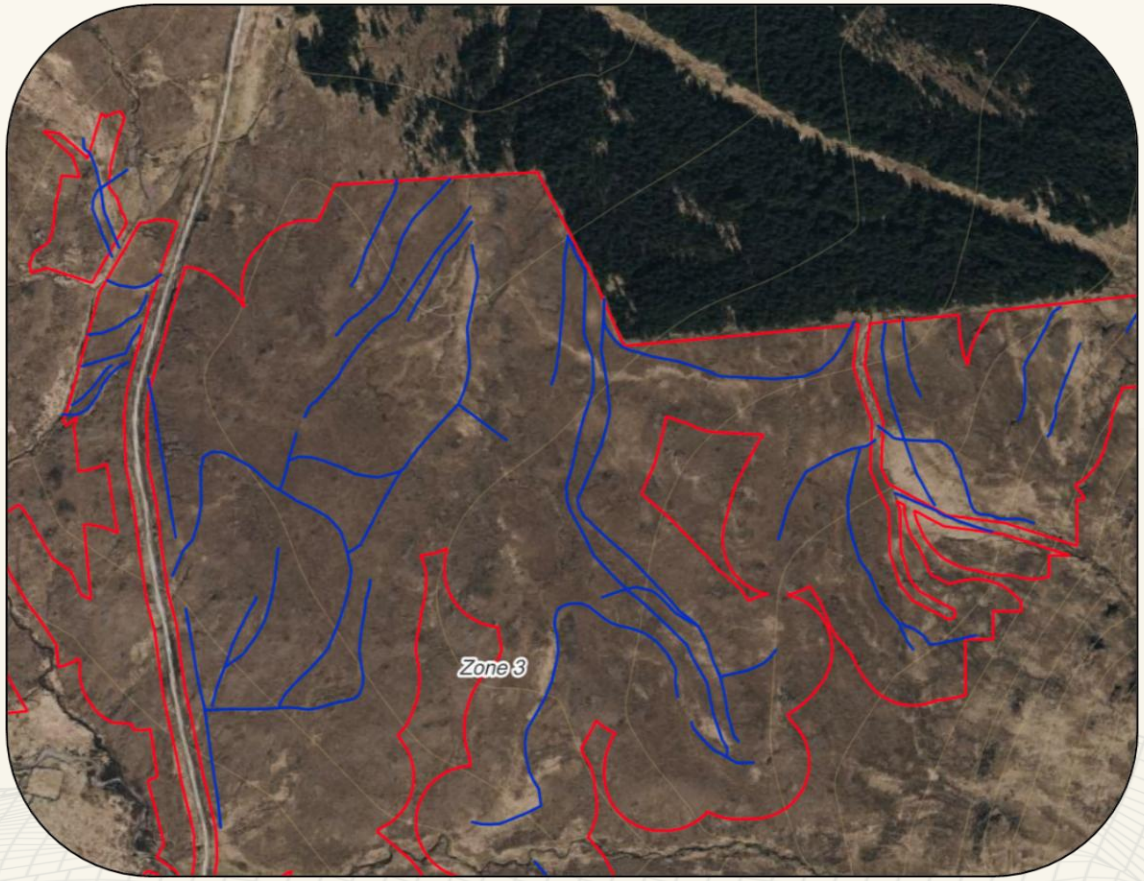
Former peat cutting banks are common in this area. These have vertical bare faces, obscured by hanging heathy vegetation. The lowered zone at the toe should be oblique or cell bunded to reduce the height difference in the water table

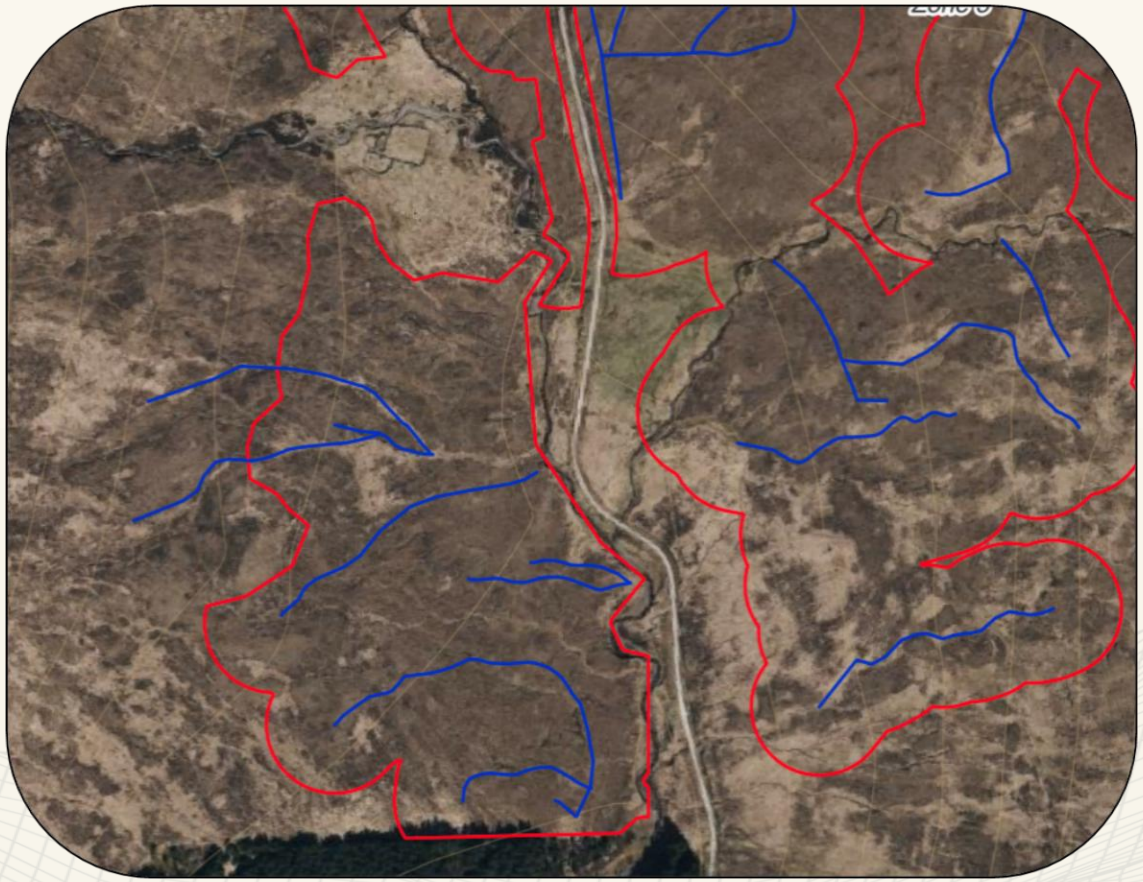
Artificial Drains

Drains vary in function but most warrant some form of intervention. Block drains using zippering and wave damming techniques, or just wave damming where already quite occluded.

Work Zone 3

This zone has a mixture of drains and cut banks and some erosion features. The work zone is split into several distinct areas either side of the watercourse and road. This zone has the majority of the erosion in this project phase and is the highest work unit, so should be treated earlier in the programme to avoid harsher winter weather.





Work Zone 3 - Typical Features

Eroding Pools and areas of active erosion

Treat these features by reprofiling and revegetating. Use undermine or pack reprofiling methods wherever possible. Supplement with targeted peat dams and micro-turf dams in places.

Artificial Drains

Block drains using wave damming and zipping techniques. Lower the relic spoil line as part of this process