

**OLD QUAY SCHOOL BALLINA
PETRIFYING SPRING SOIL REMOVAL AND SCRUB CLEARANCE
February 2024**

March 2024



Scrub clearance by hand from petrifying spring area, February 2024



Report produced by Denyer Ecology

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1 INTRODUCTION

Denyer Ecology was commissioned by River Moy Search and Rescue Ballina to supervise and monitor soil and vegetation clearance from an area of petrifying springs along the shore of the Moy Estuary SAC, near the Old Quay House, Ballina. The petrifying spring(s) correspond to the Annex I priority habitat 'Petrifying springs with tufa formation' [*7220].

Previous surveys and habitat management

- The main petrifying spring mound was surveyed in summer 2021 by Joanne Denyer (Denyer Ecology, 2021) and assessed as an Annex I priority petrifying spring [*7220]. It was becoming overgrown with scrub, and it was advised that sensitive scrub clearance be undertaken.
- In November 2022, the scrub was cleared by hand from the spring by a contractor under supervision by Joanne Denyer (Denyer Ecology, 2023).
- In September 2023, the non-native invasive species Winter Heliotrope *Petasites pyrenaicus* was chemically treated from the bank immediately above the slope. The treatment was undertaken by Enviroco and involved leaf wiping by hand with Roundup Biactive XL (PCS No. 04660) (Enviroco, 2023). This was supervised by Joanne Denyer.
- In September 2023, three monitoring plots were undertaken on the main spring mound. It was found that there had been an increase in petrifying spring vegetation in response to the vegetation clearance.

Following on from this work the following was recommended and undertaken in the habitat conservation and restoration work in February 2024:

- Removal of regrowth of scrub on the main petrifying spring and clearance of tall vegetation and leaf litter.
- Removal of soil from the lands to the south of the main spring mound. This area has water discharging from the riverbank (under scrub) and it was suspected that the area supports further petrifying spring/ seepages. Vegetation had been dumped in this area (mainly garden waste) over many years and the springs had become buried.

1.1 Relevant expertise

Dr Joanne Denyer (Denyer Ecology)

Dr Joanne Denyer is a highly experienced botanist and bryologist with 20 years' experience of ecological survey and research. She is experienced in the identification of all plant groups, including difficult groups such as aquatic macrophytes, charophytes and bryophytes. Dr Denyer specialises in wetland habitats and including Annex I habitat priority petrifying springs and has worked on a wide range of projects and sites in relation to this habitat. This includes detailed survey, assessment and monitoring, Ecological Impact Assessment and acting as an expert witness on calcareous springs at Oral Hearing. She provides advice on this habitat to County Councils and National Parks and Wildlife Service (NPWS). In 2018 she assisted NPWS in the Article 17 reporting (national Conservation Status Assessment) on Petrifying springs to the European Commission (under Article 11 of the Habitats Directive, each member state must report every 6 years on the conservation status of Annex I habitats). She is the lead author of the recently published NPWS Irish Wildlife Manual No. 42, 'Guidelines for the assessment of Annex I priority petrifying springs in Ireland' (Denyer et al., 2023).

1.2 Consultation

The following organisations and individuals were consulted for this project:

- National Parks and Wildlife Service (relevant permits were obtained by River Moy Search and Rescue Ballina).
- Site landowners (undertaken by River Moy Search and Rescue Ballina)

1.3 Plant species nomenclature

Vascular plant nomenclature follows that of the *New Flora of the British Isles*. 4th Edition (Stace, 2019). The bryophyte nomenclature adopted by Blockeel et al. (2021) is used.

2 METHODOLOGY

2.1.1 Scrub clearance

- Scrub clearance was undertaken in February 2024 by a team of 5 contractors with experience of working on sensitive sites.
- Vegetation clearance was undertaken outside of the breeding bird season and with relevant permission from National Parks and Wildlife Service (NPWS).
- The scrub clearance was supervised on site by a petrifying springs ecologist (Dr Joanne Denyer).
- Clearance was undertaken using hand strimmers and chainsaws (where required for woody vegetation).
- The vegetation clearance avoided the petrifying spring vegetation (e.g. Variegated Horsetail *Equisetum variegatum*) and bryophytes (e.g. *Palustriella commutata*).
- The invasive plant Winter Heliotrope was treated from the bank above the spring in September 2023. This has now died back, and Enviroco advised that vegetation clearance could be undertaken on the spring. The area of dead vegetation where Winter Heliotrope had been present was avoided during the vegetation clearance works. Works were supervised by the project ecologist.
- The access routes, working area and removal of vegetation all avoided Winter Heliotrope areas.
- All material that was cut on the spring was raked and removed from site. The rakes were used lightly so as not to damage any petrifying springs vegetation below.

2.1.2 Soil removal

- There was no Winter Heliotrope present in the area where the soil removal was undertaken.
- The soil to the south of the main spring mound was removed using a digger.
- The soil was removed until a rock layer was encountered on the bank and the bank profiled to match the land to the north and south.
- The soil was stored on the top of the bank whilst works were being undertaken. This was removed the same day by lorry and taken to a certified landfill facility.

3 RESULTS

3.1 Scrub clearance

Photos of the spring mound before and after vegetation clearance are shown in Photographs 2.1-2.2. There had been some re-growth of woody and tall vegetation since the previous clearance in autumn 2022, although this is difficult to see in the photographs as it was winter (and vegetation had died back). Clearance of the vegetation allows more light onto the petrifying spring vegetation (e.g. Photograph 2.2b), reduces the drying effect of woody vegetation and reduces nutrient levels within the spring.

3.2 Soil removal

Photos of the area to the south of the spring mound, before and after soil removal are shown in Photographs 2.3-2.4.

A spring was uncovered on the lower part of the bank (Photograph 2.4b). This had good water flow and some tufa formation near the spring source (Photographs 2.5a-2.5b). In addition, there was some paludal tufa formation on bryophytes (Photograph 2.6) and strong cascade tufa formation on the bank where the spring joins the estuary (Photograph 2.7). There were at least two further springs emerging on the bank to the south (Photographs 2.8-2.9), but it wasn't possible to reach these areas with the mechanical digger. Scrub was cleared by hand as much as possible to increase light in these areas.

Photographs 2.1-2.11. View of petrifying spring mound before (photos on left) and after (photos on right) vegetation clearance

<p>Photograph 2.1a. Before vegetation clearance with woody vegetation regrowth in the area formerly covered in scrub (view to E from estuary)</p> 	<p>Photograph 2.1b. After vegetation clearance with scrub removed and bryophytes more visible (view to E from estuary)</p> 
<p>Photograph 2.2a. Before vegetation clearance with woody vegetation (view to NW from roadside)</p> 	<p>Photograph 2.2b. After vegetation clearance with bryophytes and spring flow more visible (view to NW from roadside)</p> 

<p>Photograph 2.3a. Before soil removal – the area is covered with dumped garden waste (view to E from estuary)</p> 	<p>Photograph 2.3b. After soil removal – the natural profile of the bank is now visible (view to E from estuary)</p> 
<p>Photograph 2.4a. Before soil removal – the area is covered with dumped garden waste and the spring is covered with woody vegetation (view to E from estuary)</p> 	<p>Photograph 2.4b. After soil removal – spring exposed from under scrub (view to E from estuary) [the soil pile on top of the bank was later removed].</p> 

<p>Photograph 2.5a. Newly exposed spring with water emergence point shown by red arrow. Tufa formation (pale/ white colour) is visible (view to N)</p> 	<p>Photograph 2.5b. Newly exposed spring with water emergence point shown by red arrow. Tufa formation (pale/ white colour) is visible (view to S)</p> 
<p>Photograph 2.6. Paludal tufa (white crust) formation on bryophytes in newly exposed spring</p> 	<p>Photograph 2.7. Strong tufa formation, with blue colour from cyanobacteria/ algae on the tufa, where newly exposed spring flows over bank into estuary</p> 

<p>Photograph 2.8. Spring to the south of the newly exposed spring, with hand clearance of scrub (view to E from estuary)</p> 	<p>Photograph 2.9. Tufa formation on estuary bank from additional spring to south</p> 
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4 FUTURE WORK

- The main spring mound should be monitored in 2024 to see if additional vegetation clearance is needed.
- The 2023 monitoring plots on the main mound should be re-surveyed in 2024/ 2025 to assess if there has been any further change in the spring in relation to the vegetation clearance.
- The Winter Heliotrope should be monitored in 2024 to see if there is any re-growth and if a further chemical treatment is needed.
- The newly exposed spring in the soil removal area should be monitored in 2024 to see if there is any recovery of petrifying spring vegetation. It may be possible to transplant some petrifying spring bryophytes (with advice from a petrifying springs ecologist) from the main mound to aid colonisation if the spring habitat is suitable.
- Water chemistry sampling should be repeated in 2024/ 2025 to monitor nitrate and phosphate levels in the springs.

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