Volunteer with Amphibian and Reptiles Conservation Trust SSAARs project

amphibian and reptile conservation

Where it all started as a seven-year-old Highland Biological Recorder for amphibians and reptiles.

Volunteer Surveyor for Highland Seashore Project 2014 to 2017

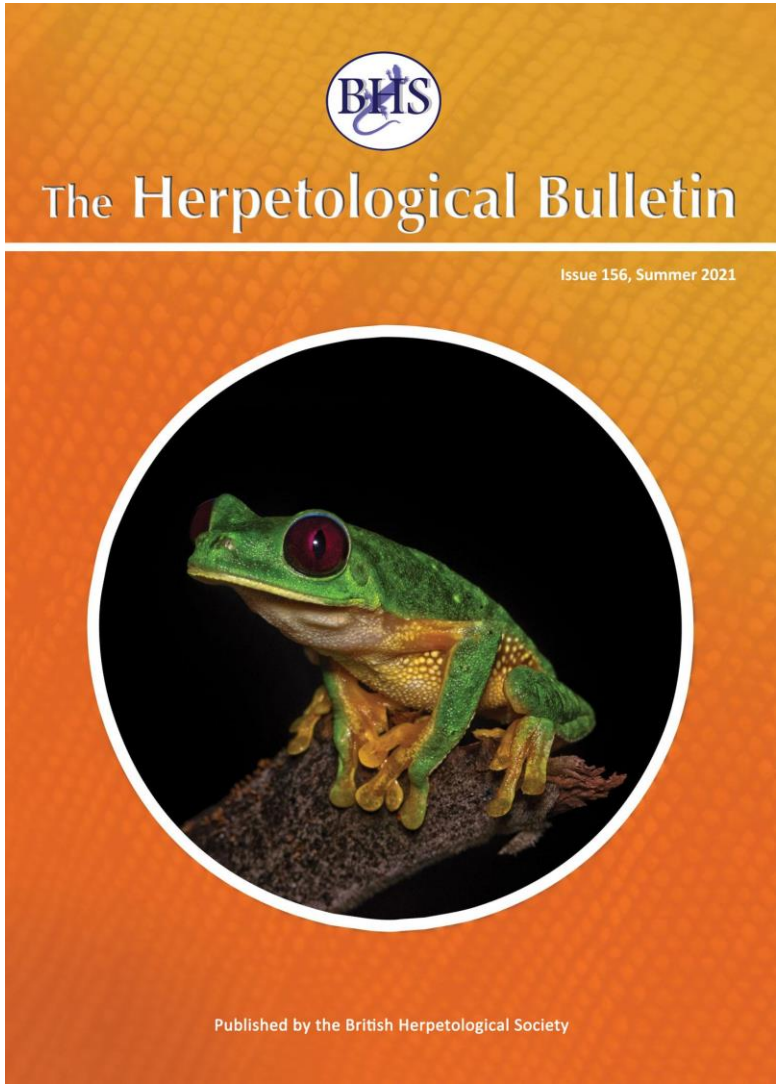
Advice and support from David O’Brien, mentor, guru, role model

Extended the survey around the whole of the Balmacara Estate, National Trust for Scotland and Coast with Babs MacRitchie.

Challenging Conditions

Blasted by wind, rain, high tide surges or snow.

Or so hot the pools dried up completely



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Persistence of a population of palmate newts *Lissotriton helveticus* in a saline environment on the west coast of Scotland

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ABSTRACT - A six year survey of a palmate newt (*Lissotriton helveticus*) population in rock pools on the west coast of Scotland indicates that this species has some tolerance of saline conditions. The newts were living with a mean salinity (conductivity) of 382 ppm (range 30.7 ppm to >4995 ppm). Other interesting observations include a variation in mating behaviour, in which normal open water behaviour is confined to crevices, and the occurrence of 'pelvic bumps' in some individuals that may indicate reduced body condition.

INTRODUCTION

Amphibians are at a significant disadvantage in saline environments as their highly permeable skin and eggs make them sensitive to water loss by osmosis. Nevertheless, 144 species of amphibian have been recorded in saline habitats worldwide (Hopkins & Brodie, 2015). Of those 144 species only 24 passed all their life history stages in saline waters; *Lissotriton helveticus* does not appear in this group. It is best known as an opportunistic inhabitant of neutral to weakly acidic waterbodies in northern Europe. There are a limited number of observations of other newt species in coastal environments, notably the smooth newt (*Lissotriton vulgaris*) in sand dunes in northern England (Hardy, 1943) and in a range of habitats on the coast of Croatia (Popovic & Veletanlic, 2018). However, the only record of *L. helveticus* in a saline environment is from Smith (1951) who associated the species with coastal brackish pools.

The present study was initiated following casual observations in the West Highlands of Scotland by Deichsel and Bennon (pers com.). On 25th August 2010, Deichsel observed both adult and larval *L. helveticus* in a supra-tidal pool by Loch Linnhe (56° 48' 59.33" N: 5° 06' 43.49" W), while on 15th September 2010, Bennon recorded adult newts in a pool one metre above the High-Water Spring tide mark at Kirton Bay near Lochalsh (57° 16' 17.1775" N: 5° 35' 39.2322" W). Such single observations raise many questions concerning inter-annual and intra-annual variability of a population in a habitat generally considered marginal for *L. helveticus*. These populations were still present when the sites were visited in July 2011 prompting a roughly monthly sampling survey for six years at the Lochalsh site.

MATERIALS AND METHODS

Survey site

The survey site was a complex of pools on a rocky platform of Torridonian sandstone. It sits one metre above the mean High Water Spring tide mark on Kirkton Bay, Lochalsh, West Highlands. The platform is backed by cliffs rising to 50 m above sea level and faces the Kylerhea narrows, Loch Alsh (Fig. 1). The surveyed pools ranged in surface area from 0.5 m^2 to 3 m^2 with depths of 0.25 m to 0.5 m; both surface area and depth varied greatly throughout the year. During the hot dry summer of June 2012 the pools were reduced to a few centimetres in depth. After high tides with storms and heavy rainfall the pools were overflowing and ran into each other.

Figure 1. The survey site showing the complex of rock pools on a Torridonian sandstone platform at Kirkton Bay

Newt population survey

The site was surveyed from 26th February 2012 to the 21st October 2017 with one visit each month, weather permitting. On the first survey every pool on the rocky platform was surveyed for *L. helveticus* activity. Those pools with adults or larvae received an identification number painted on a marker beside the pool and each pool was geolocated. On each survey the pools were watched for any signs of life: swimming adults or movements beneath rocks or within crevices. Notes were made on water clarity, vegetation growth (mostly filamentous green algae), presence or absence of any decaying seaweed (post extreme high tide and storm events), breeding and egg laying behaviour.

After observation, the pools were sampled with a pond

The Results

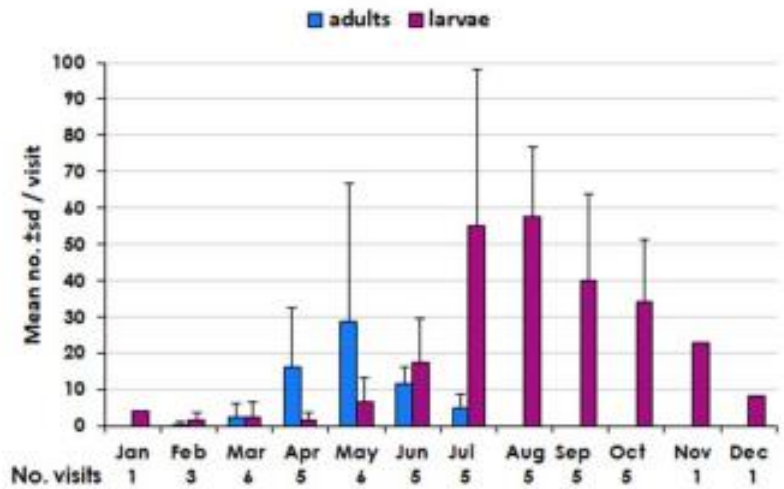

Figure 2. Mean (±sd) monthly catch of adults and larvae of *Lissotriton helveticus*, 2012 to 2017

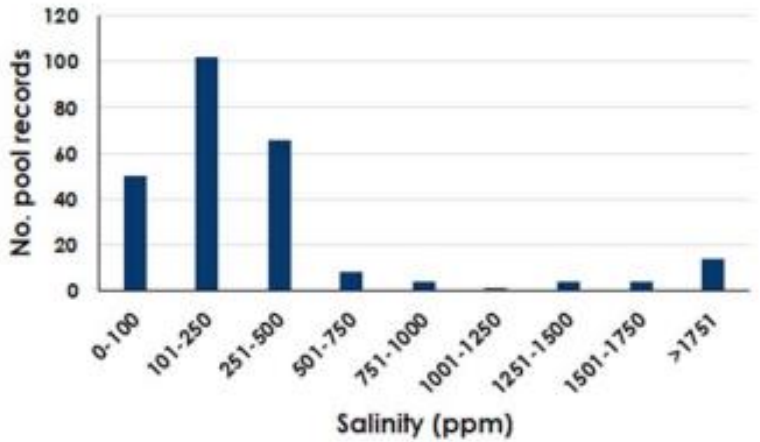

Figure 4. Frequency distribution of salinity ranges (derived from conductivity measurements) of Kirkton pools, 2015 to 2017


Smooth newt
Lissotriton vulgaris
Palmate newt
Lissotriton helveticus
Common lizard
Adder
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Treasurer of the University of Edinburgh Wildlife Society

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- And of course, I still go back, when I can, to the old stomping ground where it all started.
- Thank you for listening!

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