



Native Species Biodiversity Action Plan 2023-2024

**CS G.1,4-6
JW/DZC April 2023**

Context:

Dudley Zoo & Castle (DZC) is owned and operated by the Dudley & West Midlands Zoological Society; a registered charity (no. 507221) established in 1978.

The charity's aim is to provide Dudley Zoo & Castle (DCZ) visitors and community, via our education and conservation activities, with an understanding and awareness of all elements of the park's unique site, the history of the castle and the geology, the importance of the architectural design of the Tectons, and the opportunity to get closer to the world's rarest animals.

Dudley Zoo & Castle's mission statement is;

- ✓ *"To inspire and excite people in the natural world, in the history and geology of the site on Castle Hill, and to encourage and promote a better understanding of and support for the conservation of nature and our heritage."*

The Native Species Biodiversity Action Plan has been developed to enable progression towards the wider strategic goals and objectives outlined within the Dudley Zoo & Castle 2022-2027 Conservation Strategy, which in turn ensures the organisation is meeting its mission statement.

Introduction:

The conservation work of zoos should not be limited to exotic species from exotic habitats. They must also have a role to play in the protection of native endangered species of both flora and fauna through habitat management within their grounds and captive breeding programmes.

The interest in Native species stemmed from one of the outcomes of the Earth Summit in Rio de Janeiro in 1992. The Convention on Biological Diversity (more commonly referred to as the Biodiversity Convention) which was signed at the conference has three main goals. These are the conservation of biodiversity; the sustainable use of its components and fair and equitable sharing of the benefits arising from genetic diversity.

Since then at both the EU Summit in Gothenburg in 2001 and the World Summit on Sustainable Development held in Johannesburg in 2002 a deadline of 2010 was set for a significant decrease in the current rate of loss of biological diversity.

In Great Britain this has led to the establishment of a Biodiversity Action Plan or BAP, which serves to implement the outcome of the Convention through the conservation of individual species and specific habitats.

Here at Dudley Zoo & Castle we recognise not only our obligation to help reduce biodiversity loss but also to promote the growth of biodiversity in the way we manage our landscapes. Management of the various habitats such as woodland, grassland and wetlands for native species is being undertaken and will be moved forward as part of the zoos site masterplan.

Historically, much of the zoo's work in native species conservation has been carried forward by Ian Hughes, first as an employee of DZ&C and later through his retention as a Native Species consultant and coordinator. It was in this role that Ian served a term as chair of the BIAZA Native Species Working Group.

This work was then carried forward from 2016 until 2022 by a full time Conservation Officer whose role includes managing the native species conservation on site, carrying out species surveys, liaising with local wildlife and conservation groups and raising awareness of conservation by assisting our keeping and education staff in the implementation and delivery of enjoyable and informative events and workshops.

Following the COVID-19 pandemic, and the departure of Chris Leeson (Conservation Officer, 2016-2022), native species surveying and management has been left largely untouched until 2023 (see progress report at rear of document).

Notable Achievements (2017-2020):

Bats

Over the last 5 years with the support of Birmingham and Black Country Bat Group the zoo has conducted surveys under national England licencing to better understand the makeup of the Bat population on the zoo and the surrounding area.

We have two hibernation sites and one swarming site on the zoo grounds which are Big Ben Cavern and Stores Cavern. These two caverns have been subject to mark and recapture projects through the licence holder "Brumbats". Upon capturing the bats using mist nets and harp traps we have conducted mouth swaps of individuals which contributed to a wider project to determine population isolation in bats across the Birmingham and Black Country region.

The zoo has identified 9 bat species on-site in the last 5 years including the locally rare Lesser Horseshoe bat which is at its North most range at Dudley Zoo.

The work so far has produced one MSc research paper which has determined the delay in emergence of bats within an urban environment as well as the importance of the caverns to individual species usage. Work undertaken has also produced data to be included in a PHD project at Wolverhampton University, and has led to a presentation at the BIAZA AGM which aimed to encourage other zoo's to provide habitat for bat species.

Bird Ringing

We currently conduct bird ringing activities on-site with our C licence holder Emma Dingley (Animal Keeper, Upper Primates). We typically conduct surveys from Spring through to Autumn. Currently, we are ringing mainly passerine species however we have had a few numbers of migratory birds such as redwing and fieldfare.

Small Mammal Trapping

In 2017 Dudley Zoo & Castle took on a small mammal trapping project with a MSc student from Wolverhampton University. Through this we have been able to gain a better understanding of the species that inhabit the zoo. The project has now been published in Zoo Biology in 2021 under the title "The effects of a zoo environment on free-living, native small mammal species". The student, Emily Elwell, whom wrote it is now being funded by us to undertake a PHD.

iNaturalist & City Nature Challenge (Preamble)

Since 2019, the Birmingham and Black Country has taken part in the City Nature Challenge, which is a global competition to see which city in the world is most biodiverse (data collected through the iNaturalist app). In 2019 and 2022 the zoo encouraged people to take part both at home and within the zoo through our social media and website posts. DZ&C also took part ourselves on site with Dudley Zoo and Castle being one of the top 5 contributors in the borough. This led to the region being the most biodiverse in Europe (during each year respectively).

iNaturalist & BIAZA Spotted On Site (Preamble)

Following on from this success, DZ&C began participating in the BIAZA Spotted On Site campaign in 2022 – which again, encourages and incentivises BIAZA members to record

native species sightings via the iNaturalist app (which in turn contributes to the City Nature Challenge at relevant times).

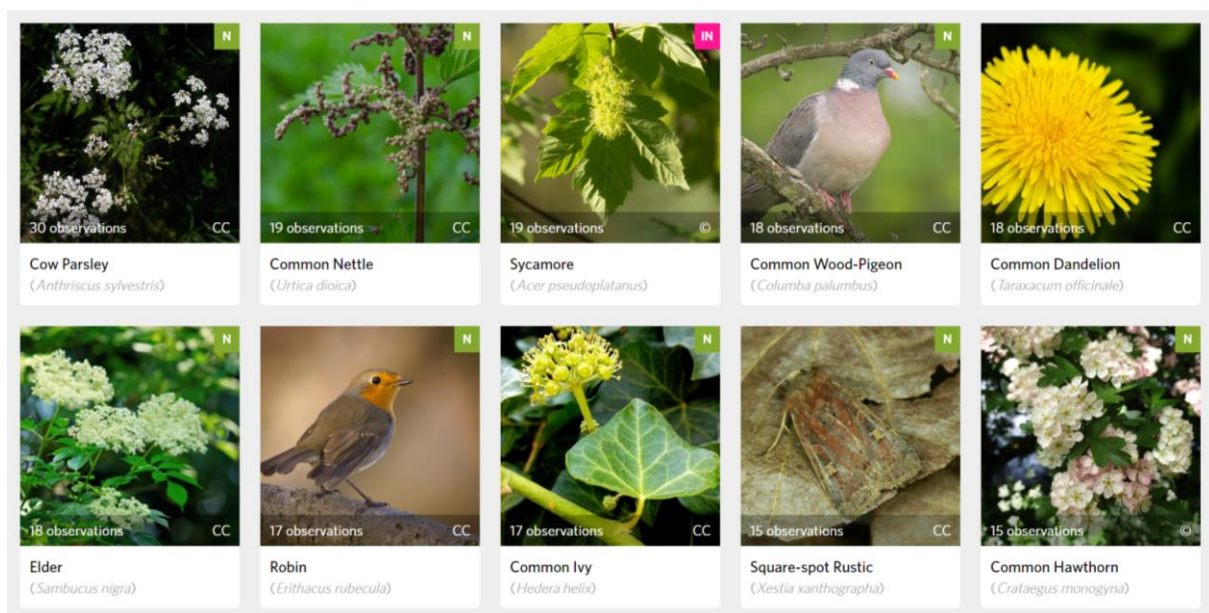
iNaturalist & BIAZA Spotted On Site (Existing Data)

As of the 14th April 2023, 1277 observations have recorded under the 'Wildlife at Dudley Zoo & Castle' project. This data includes 389 species and has been collated by 20 observers and 313 identifiers.

A map of these observations is generated by the iNaturalist map, identifying biodiversity hotspots across site:



iNaturalist also tracks the frequency in which species are recorded, automatically generating a top ten recorded species list:



A full account of the number of species recorded (and the frequency in which they are recorded) prior to Friday 28th April 2023 can be found on the Hive under the file 'Native Species BAP 2023.' A separate data recording will be generated between Friday 28th April and Monday 1st May 2023, in line with the BIAZA Spotted on Site Bioblitz event (see below).

Newly Proposed Native Species Biodiversity Action Plan (2023):

In line with the newly developed Dudley Zoo & Castle Conservation Strategy 2022-2027, the zoo aims to develop a new native species biodiversity action plan (BAP) for the site. The site will follow the recommended steps outlined within the JZAR paper 'Zoo BAPs: biodiversity action plans for conserving native wildlife in and around zoological gardens' published by Hambly & Marshall 2014.

A full site assessment will be undertaken throughout 2023 (assess knowledge), which will help identify key species, habitats, targets and timescales in early 2024. A timeline of 2023 event is outlined below.

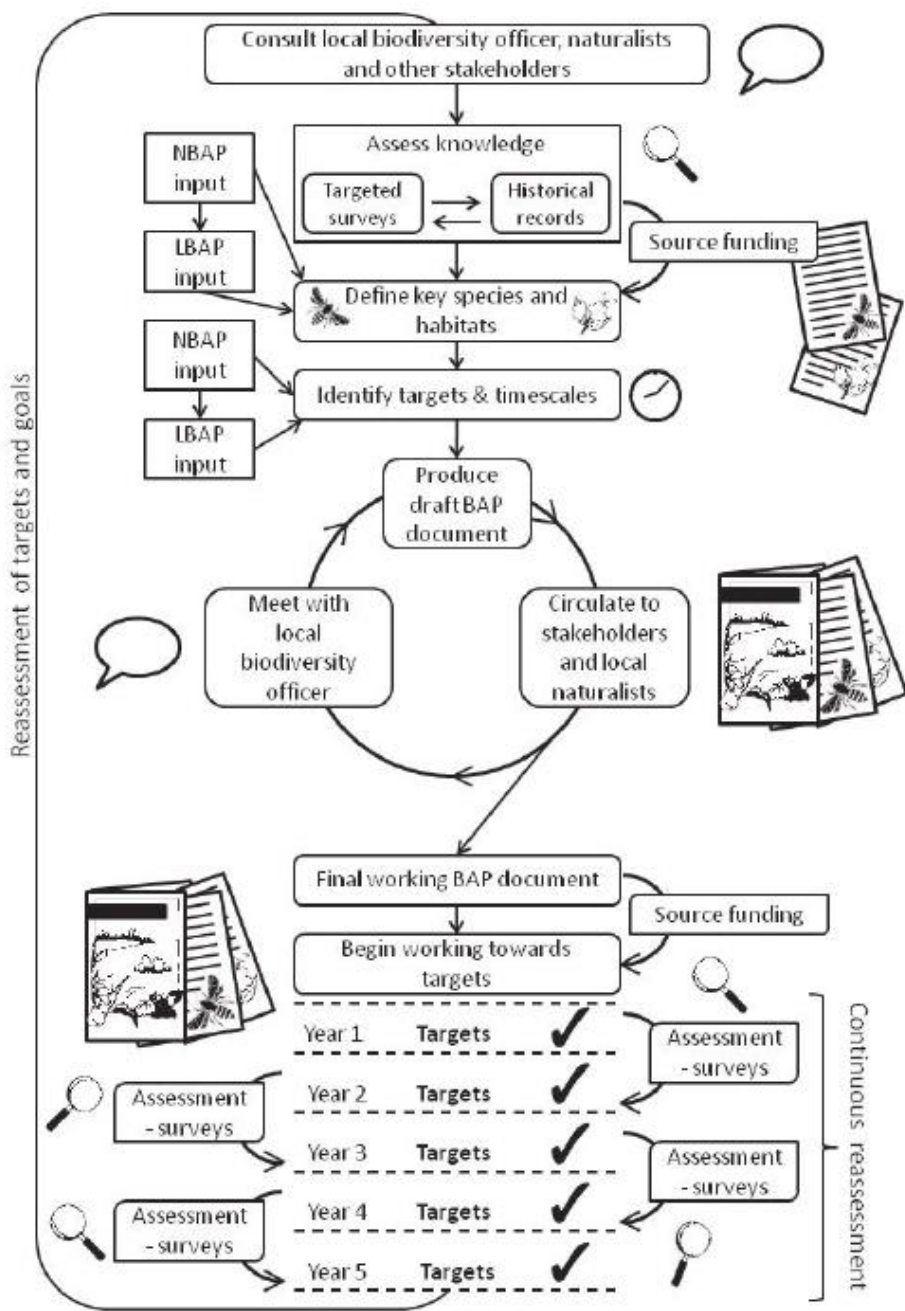


Figure 1. Recommended steps for creating and evaluating a five year Zoo Biodiversity Action Plan (Zoo BAP). NBAP = National BAP, LBAP = Local

- ✓ **April 28th-May 1st 2023:** Soft launch of new native species initiative on social media and website. Coincide with BIAZA Spotted on Site Bioblitz and City Nature Challenge.
- ✓ **May 2023;** Consult biodiversity officers, naturalists and other stakeholders.
- ✓ **May-October 2023;** Assess knowledge through a calendar of public and staff only survey events across the DZ&C site.
- ✓ **October-December 2023:** Cross reference survey data with historic data.
- ✓ **January 2024 onwards:** Begin developing BAP with stakeholders and senior zoo management, identifying target species, habitats and targets.

The plan is led by the Dudley Zoo & Castle Education Department and will involve staff from across DZC as appropriate, using the site and its facilities for the delivery of educational activities:

Department:	Participating Staff:
Education	Eve Carter (Newts) Frances Lovell (Bats) Rosie Whiteside Jack Williams
Birds	Kasper Hansen
Carnivores	Louisa Dorrington
Farm	Kirsty Thornton
Lower Primates	Jodie Dryden Stacey Evans
Ungulates	Melissa Pilmore
Upper Primates	Emma Dingley (Bird Ringing)

*Representative for department.

Survey Calendar:

Species:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Amphibian												
Bat (Activity)												
Badger												
Birds (Breeding)												
Fungi												
Invertebrates												
Plants												
Reptile												
Small Mammal												

A full report of survey dates and recordings is maintained within separate spreadsheets/documents under the Hive.

2023 Progress Report:

Spring Surveying; Great Crested Newts

In Spring of 2023, we partnered with the Birmingham and Black Country Amphibian & Reptile Group (BBCARG), who assisted us with great crested newt (*Triturus cristatus*) surveys in our pond sites around the perimeter of the castle wall. Historically, the ponds were home to a thriving population of great crested newts, however a live specimen has not been recorded since 2020 and the ponds themselves have deteriorated in quality.

Survey date	Site name	Pond name	Grid reference	Activity completed	Smooth newt			
					M	F	Juv	Egg
26/04/2023	Dudley Zoo	Waterfall Pond 1	SO 94754 90734	Torch survey (20:00 - 21:00)				
26/04/2023	Dudley Zoo	Waterfall Pond 2	SO 94759 90743	Torch survey (20:00 - 21:00)	1	1		
26/04/2023	Dudley Zoo	Waterfall Pond 3	SO 94760 90752	Torch survey (20:00 - 21:00)				
26/04/2023	Dudley Zoo	Waterfall Pond 4	SO 94760 90760	Torch survey (20:00 - 21:00)				
26/04/2023	Dudley Zoo	Waterfall Pond 5	SO 94759 90767	Torch survey (20:00 - 21:00)				
03/05/2023	Dudley Zoo	Waterfall Pond 1	SO 94754 90734	Torch survey (20:30 - 21:30)	1			
03/05/2023	Dudley Zoo	Waterfall Pond 2	SO 94759 90743	Torch survey (20:30 - 21:30)	4			
03/05/2023	Dudley Zoo	Waterfall Pond 3	SO 94760 90752	Torch survey (20:30 - 21:30)				
03/05/2023	Dudley Zoo	Waterfall Pond 4	SO 94760 90760	Torch survey (20:30 - 21:30)				
03/05/2023	Dudley Zoo	Waterfall Pond 5	SO 94759 90767	Torch survey (20:30 - 21:30)				
10/05/2023	Dudley Zoo	Waterfall Pond 1	SO 94754 90734	Torch survey (21:00 - 22:00)	2	3		
10/05/2023	Dudley Zoo	Waterfall Pond 2	SO 94759 90743	Torch survey (21:00 - 22:00)	4	3		
10/05/2023	Dudley Zoo	Waterfall Pond 3	SO 94760 90752	Torch survey (21:00 - 22:00)				
10/05/2023	Dudley Zoo	Waterfall Pond 4	SO 94760 90760	Torch survey (21:00 - 22:00)				
10/05/2023	Dudley Zoo	Waterfall Pond 5	SO 94759 90767	Torch survey (21:00 - 22:00)				

No live specimens were found, however a number of adult male and female smooth newts (*Lissotriton vulgaris*) were found over three evenings.

Following these surveys, we undertook an eDNA test (via Cellmark) to test for the presence of great crested newt in the pond sites. The eDNA test was negative for the presence of great crested newt DNA.

Following this result, DZC intends to undertake a full renovation and restoration of the pond sites surrounding the perimeter of the castle. This will be undertaken in an effort to improve biodiversity and increase accessibility to the ponds (via a boardwalk, for the purpose of pond dipping/learning sessions).

DZC BioBlitz:

DZ&C launched its new Native Species BAP ambitions via a public-facing BioBlitz event, on the weekend of Friday 28th April to Monday 1st May – coinciding with the BIAZA Spotted on Site (SoS) BioBlitz campaign and the City Nature Challenge. During this weekend, both staff and visitors alike are encouraged to contribute to our iNaturalist project heavily during this four-day period. A £25.00 Amazon gift voucher was awarded to the staff member with the greatest number of contributions during this period.

A total 1,046 observations were made by 19 participants, spanning 248 species, during this four day period (visible under the 'Dudley Zoo & Castle SoS BioBlitz 2023' iNaturalist Project). This increased the number of observations on the 'Wildlife at Dudley Zoo & Castle' iNaturalist Project to 2,370 observations by 39 participants, spanning 510 species.

DZC contributed more observations than any other BIAZA member during this four day period. DZC also added over 1000 observations to the Birmingham & Black Country City Nature Challenge, resulting in the Birmingham & Black Country leading on the City Nature Challenge leader board in the UK.

During this four day period, alongside the weeks that followed, the education department set multiple moth traps – gaining an insight into moth species diversity on site. Emma Dingley, Upper Primates, also undertook multiple bird ringing and surveying sessions throughout the zoo site as well.

As a result of the Bioblitz event, and alongside the renovation of the pond network on the exterior of the castle wall, DZC intends on replacing and rejuvenating various bird feeders on site. The gardening and grounds team have also began work on a collection of bug hotels throughout the zoo. These bug hotels have been accompanied with relevant interpretation.

Useful links:

[BIAZA Event: SoS Bioblitz Weekend!](#)

[BIAZA Campaign: Spotted on Site](#)

[Birmingham & Black Country: City Nature Challenge 2023](#)

[iNaturalist Project: Wildlife at Dudley Zoo & Castle](#)

[iNaturalist Project: BIAZA Spotted on Site](#)

[iNaturalist Project: SoS Bioblitz Weekend!](#)