



WINGHAM WILDLIFE PARK

CONSERVATION PLAN & IMPACT STATEMENT

**2022 (V2.0) "2021, A TURNING POINT FOR
WWP CONSERVATION"**

Wingham Wildlife Park

Conservation Plan & Impact Statement

2022 (V2.0)

“2021; a Turning Point for WWP Conservation”

Compiled 27th March 2022

By Markus Wilder

Due for review and renewal by end of May 2023

(Previous document released 6th July 2021)

Wingham Wildlife Park

working in association with

Wingham Wildlife Park Animal Welfare

(reg charity number 1162346)

*“Working together for nature, to bring the
highest level of quality to our conservation
& education work”*



goodbye uganda

Introduction

2021 was a strange year for us when it comes to conservation - a busy one but mostly in regard to house-keeping, planning and getting the ball rolling in a new direction for the park. However, that's not to say that we haven't had a productive year with getting projects off the ground and conservation wheels moving.

We said goodbye to our Ugandan chimpanzee project as a sad by-product of bureaucracy but instead took big pro-active steps in a more domestic direction as we completed our first year of working with white clawed crayfish and made plans for yet more native species work moving forward. In a way it may have been a blessing in disguise as it reminded us that conservation doesn't have to be on the other side of the world, but that there are plenty of species right here on our door step which need our help too.

That's not to say that we are no longer sending support abroad, as many of the most endangered species and habitats can be found in these areas, but instead we will be better splitting our time and resources between the two. We continue with our commitment to supporting habitats in Vietnam and in fact are working on some exciting co-operative work in Vietnam in the very near future to further support what we are already doing with World Land Trust.

It's certainly safe to say that there is a very exciting period coming up for Wingham Wildlife Park (WWP) and Wingham Wildlife Park Animal Welfare (WWPAW), which will see us hopefully making a meaningful, tangible impact on our missions to support habitats and species around the world and educate about the issue faced by so many species in the wild.

So, without further introduction let's get in to this document to discuss what we have done over the past year, where we are heading in the coming years and how you can help us moving forward. We couldn't do this work without the support of all of you, so thank you for helping us to continue with this very important work.



hello kentish countryside

Our Approach to Conservation

The only way in which we are going to make a meaningful impact on the natural world, to try and reverse at least some of the damage which has been done to this planet is if we all work together and tackle all of the issues in a combined approach. We have been preaching and working towards this kind of combined approach to conservation since 2016 and will continue to bring those 4 key areas; Habitats, communities, animals and ethics together.

Our work with this approach started with the Chimpanzee Community Enhancement project in Uganda, around the Bwindi Impenetrable Forest National Park where we worked with the Population Sustainability Network to combine the values of family planning, community engagement, human health and endangered species conservation. This eventually led to the production of the Thriving Together initiative, which is supported by 150 Organisations including BIAZA, Born Free Foundation, Durrell Wildlife Conservation Trust, Greenpeace, Jane Goodall Institute, the Zoological Society of London and even led to the creation of a new IUCN resolution about family planning (IUCN, 2020).





Working together for this!

This alone should be proof enough that a one plan approach to conservation is the only viable way forward for organisations wanting to make a real conservation impact - by hitting the subject from every possible or at least feasible angle.

Habitat - If we want to be able to allow animals to live in the wild and to protect them when they are there - they need safe and flourishing habitats to move in to!

Community - Communities (especially poorer ones) which may have relied on animals as a source of income or for food need alternative choices!

Animals - Through wild protection & captive breeding we will support the species which we care for at our park!

Ethics - Our ethics should be represented in the business decisions we make!

Habitats

On a daily basis our team of bird keepers, alongside looking after their own birds, also make sure to keep an eye on the birds which call Wingham Wildlife Park home, but from outside our exhibits. We try to make our park an inviting place to be for wild birds and record species, numbers and even what they're doing (breeding, feeding, finding water and rearing their families).

Habitat creation includes putting out food for them, especially in the harsher winters, making bird baths and putting up all sorts of bird boxes and shelters for different species to use.

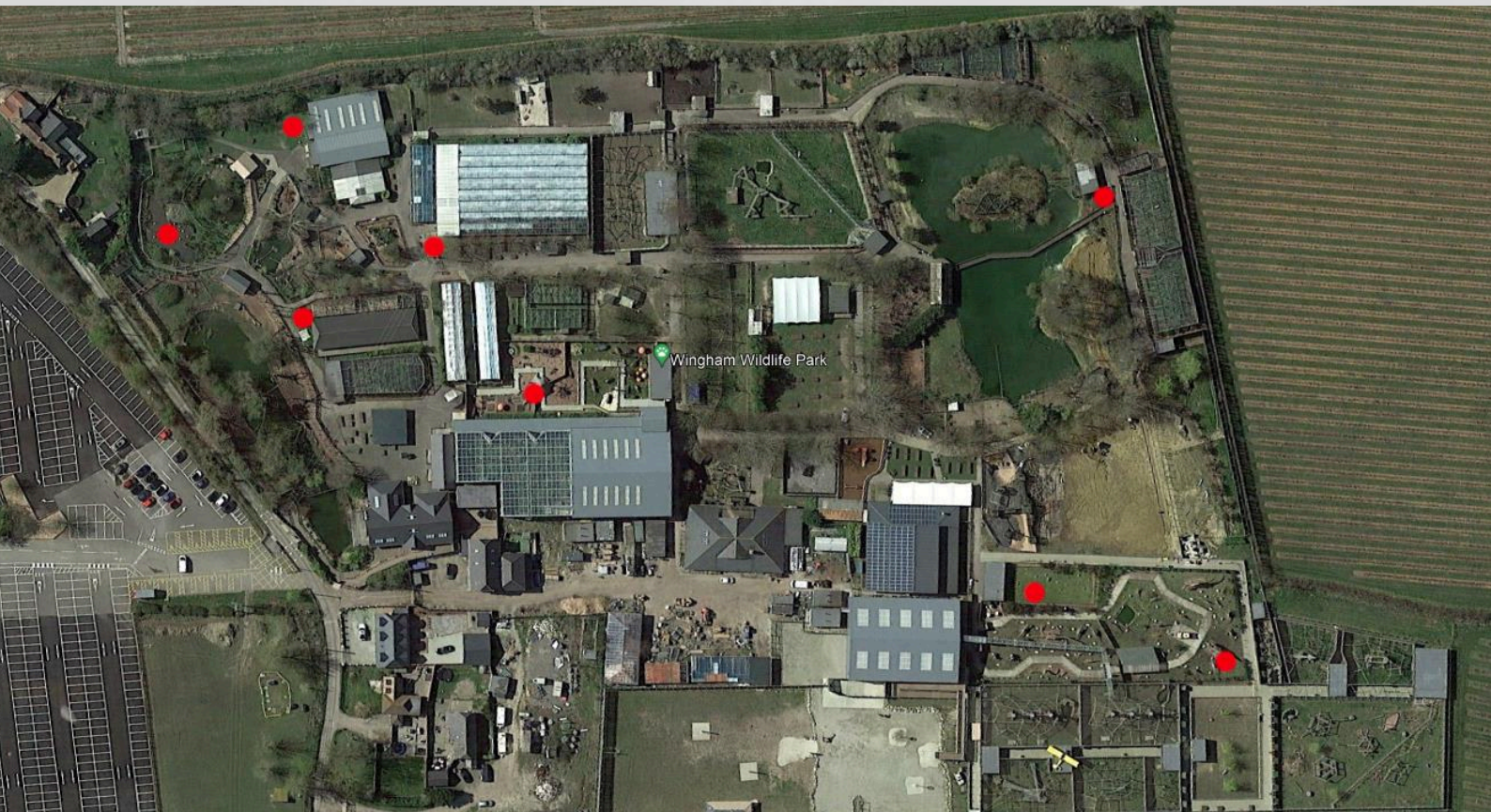
From previous anecdotal records and a project carried out in 2017 we found that around 37 species on average visited the park per year (Dibb, 2017). With our new record keeping however we can now see exactly how many species are coming, which totalled 48 species for the second half of 2021. We carried out this study for just 6 months last year, yet still gathered records for 42,459 birds at the park! The species which visited us were:

| | | |
|--------------------------|------------------|----------------------|
| Black bird | Great tit | Mandarin duck |
| Black headed gull | Green woodpecker | Mistle thrush |
| Blue tit | Grey heron | Moorhen |
| Chaffinch | Grey wagtail | Pied wagtail |
| Carrion Crow | Greylag goose | Redwing |
| Chiffchaff | Herring gull | Ring necked parakeet |
| Collared dove | House martin | Robin |
| Common buzzard | House sparrow | Rook |
| Common gull | Jackdaw | Song thrush |
| Coot | Jay | Sparrow hawk |
| Cormorant | Kestrel | Starling |
| Duncock | Kingfisher | Swallow |
| Field fare | Linnet | Water Rail |
| Garden warbler | Long tailed tit | Wood pigeon |
| Goldfinch | Magpie | Wren |
| Great spotted woodpecker | Mallard | Yellow wagtail |

The list above shows all 48 species with their UK conservation status being indicated by the text colour. Species listed in black are invasive, green are not endangered, amber are declining in the UK and Europe, whilst red species are seeing a severe decline and are globally threatened (Stanbury et al., 2021).

Daily bird species checks and creating habitats for birds isn't the only way in which we're helping to look after local species and habitats within the park grounds. As well as bird boxes and bird seeds we also work with invertebrates in our bug garden area in particular. Whilst we will be looking to further improve our invertebrate monitoring to allow us to do even more for these important little creatures, we do have some idea of the numbers we might expect in the park through our first annual BioBlitz.

Our first BioBlitz involved local scout groups who spent the morning collecting and counting species in 8 areas of the park:



This event which helped to get local kids involved and excited about spotting the wildlife around them, including some pond dipping work which was very popular indeed found a total of 48 species, made up of 14 bird species, 1 mammal species and 33 species of invertebrate, however this number could potentially be more as a total of 132 of the 487 individuals found, fell in to the categories of unidentified bee, unidentified bumble bee, unidentified butterfly, unidentified corvid, unidentified fly, unidentified ladybird, unidentified leech, unidentified slug, unidentified spider and unidentified worm.

Common kingfisher



One of the most stunning birds to visit us roughly once a year (although back in 2018 we were lucky enough for a pair to raise a family here) is the gorgeous kingfisher. From time to time you can see them (usually a male) near the islands on our lake where they use the roots to perch, holes in the bank to nest and use the lake to fish for fry and large insects.

Finally, habitat protection of course doesn't end on the boundaries of our property. We support habitat protection work as far away as Vietnam, where our support of the World Land Trust (to whom we donated a total of £1,739.34 last year with the support of our visitors who donated at the silent aviary exhibit) protects part of the Khe Nuoc Trong reserve on the Annamite Mountain Range in north-central Vietnam.

Natural regeneration of this forested part of Vietnam (which measures 52,210 acres) is being supported by its establishment as a nationally recognized protected area of Vietnam - something which wouldn't have been possible without the input from World Land Trust.



The World Land Trust partner in this area is Viet Nature, with whom we are also in direct contact to establish further conservation support to run alongside continued fund raising.

However we don't just travel half way around the world to support habitats, with native habitat work being supported right here in Kent where a mixture of management and keeping staff over a couple of days helped carry out environmental DNA collection work in 4 rivers and streams around the Canterbury and Dover areas.

This essential work which involved going in to the water to collect water, which is then run through a filter allowing any DNA holding particles to be condensed in to a small light package rather than a litre of water, will help us know which areas already have white clawed crayfish, signal crayfish and crayfish plague. This in turn allows us to better understand where we may be able to release crayfish in the future and can carry out habitat restoration and creation work. Also please remember that if you ever visit several unconnected water areas (such as for fishing or walking the dog), disinfect your equipment and footwear between the two or preferably wear different gear as crayfish plague is very easily moved from one water source to another in this way (Marshall & Nightingale, 2021).



Communities

As already mentioned in the habitats section, part of that work involved community engagement as we invited local scout groups to join us for free (allowing them entry to the rest of the park to enjoy a day out after completing the morning BioBlitz) to show our younger audience which amazing species live in their back yards. Especially the BioBlitz format which encourages people to look even closer than they usually would is a proven way of improving interest for local fauna and flora, in adults and children alike (Postles & Bartlett, 2018)

We feel that it is incredibly important to ensure that we are helping to raise the next generation of conservationists, ecologists, biologists, and environmental champions, with there being no better way to do so than to show children the animals they need to safeguard (both native and exotic) and talking to them about environmental issues. Children have more of a grasp of this issue than they are sometimes given credit for, so we are proud to have had them involved in this exercise and to have reached out to them with school talks in the past year.

Our new and improved education programme for local schools is coming into full swing in 2022 as we look forward to hopefully having the first year in a couple of years without a COVID interruption. However, in 2021 we were able to welcome a total of 5,066 children to the park as part of organised education visits of which we were able to talk to 2,603 in formal educational talks (2,258 in our classroom and 345 in keeper talks).

A large part of our conservation efforts rest on the education about and company wide implementation of policies which deal with palm oil and in particular sustainable palm oil practices rather than boycotting it in favour of less productive vegetable oils.

To better educate people (especially local businesses and schools) we offer a poster which we send out to businesses and institutions free of charge to allow them a quick and clear reference as to how to spot and procure products which contain palm oil which is certified as sustainable, and what the different types of certificates actually mean. This poster can be applied for free of charge in A3 format or may be downloaded for free from our website.

www.wwpaw.org

PALM OIL: THE LESSER EVIL



Palm oil is the world's most widely used vegetable oil, found in around 50% of supermarket shelves & has been around for over 5,000 years. Demand grows as the human population grows so let's learn how to use it sustainably!



A palm oil boycott is *not* the way! What we all need to strive for is products with less oils & fats in them, while ensuring that those oils and fats are produced in the most sustainable way.

In 2020 around *60 million* tonnes of palm oil products were used from *21 million* hectares of plantation. The second most productive oil is sunflower which would need *84.5 million* hectares to produce 60 million tonnes.

KNOW YOUR **RSPO** CERTIFICATES & LOGOS

RSPO (Roundtable on Sustainable Palm Oil) is the leading authority on ensuring that palm oil is produced in a responsible manner, however their certificates can be a little bit difficult to follow. If you ever want to be certain - members submit their palm oil figures each year, including sustainable volume.



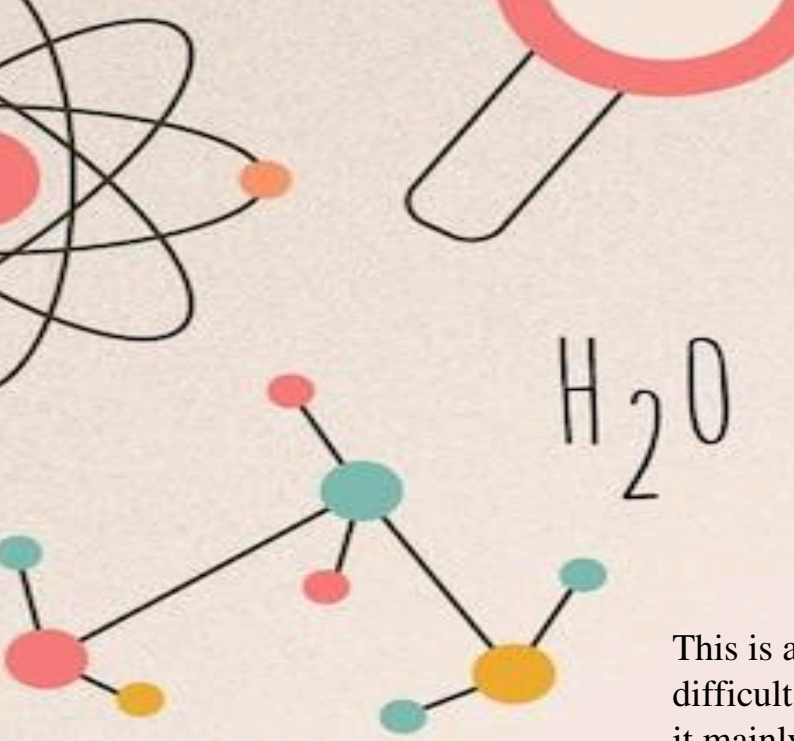
If you want your supply chain to be truly sustainable when it comes to palm oil then this is the level you want. It is for Identity Preserved and Segregated supply chains which insures that 100% of the product is from sustainable suppliers and that at least most of the process is traceable.



Mixed certification applies to the mass balance system of procuring sustainable palm oil. In this system, as long as 95% of the palm oil is sustainable, it does not matter where the other 5% comes from. For a large international producer of ice creams, this 5% may still be as much as 70 tonnes per year.



The Green Palm initiative supports the book and claim system where by a company can buy their palm oil where ever they like, pay a premium and thereby off-set their bad Palm Oil. This oil is 0% sustainable.



Citizen Science

This is a conservation action which is more difficult to fit in to our usual headings because it mainly helps researchers in the scientific community to help them process much larger volumes of data, but also helps the communities where the projects are carried out, with a knock-on effect for the animals and habitats involved. To maximise our impact whilst making it an economical activity for us to participate in we ask our office staff to each complete 1 hour per week, which can amount to almost 110 hours per year dedicated to conservation science.

That all sounds well and good, but what is citizen science?

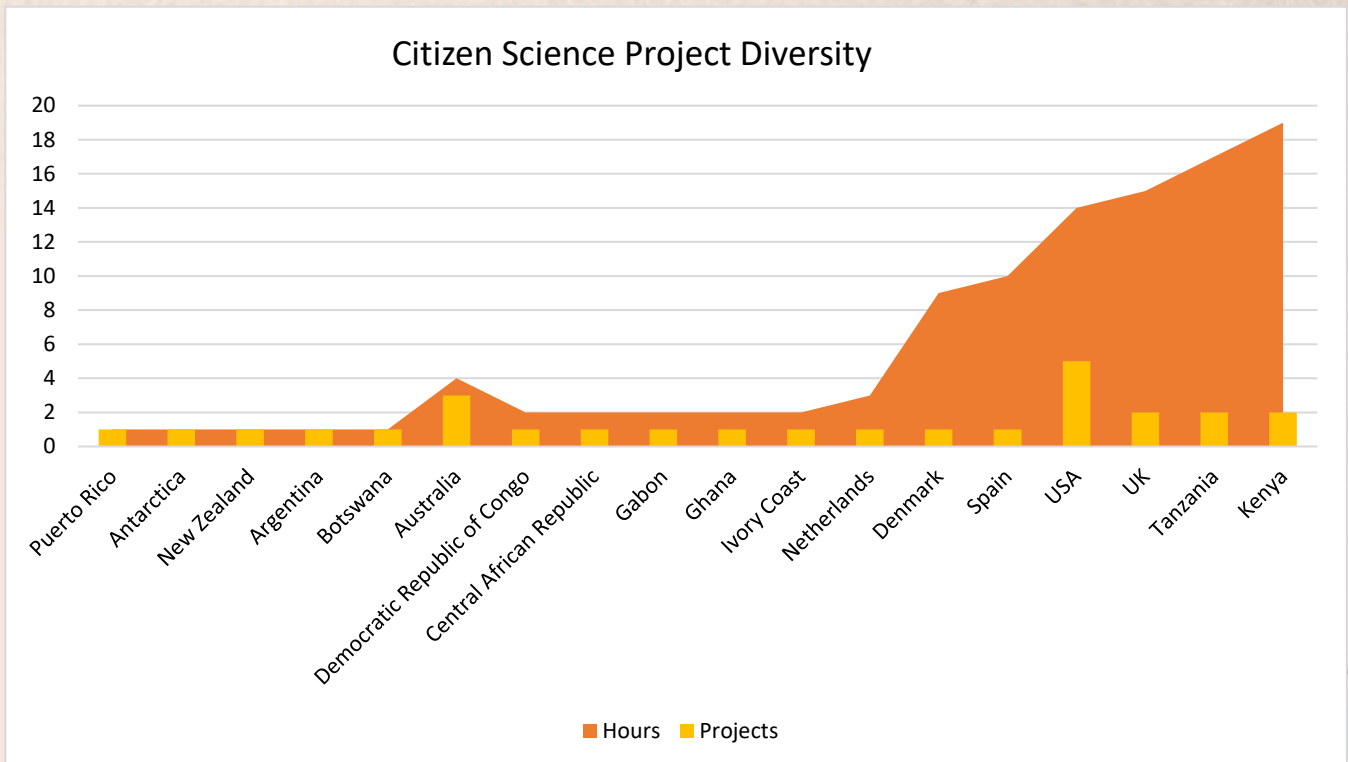
A number of scientific institutions have taken to the internet to allow the public to work on some of their research projects, especially where tasks not requiring any specialist training or skills are required, such as counting nest sites, transcribing old records or spotting animals on camera traps.

We have done this type of research for around a year now and whilst we are confident that our staff take their roles as citizen scientists completely seriously of course we had reservations about whether everyone would do the same therefore whether the data collected would be meaningful.

Research has shown that whilst there are errors these are generally no more significant or regular than those completed by professional or student scientists and that all can be handled through the correct statistical analysis (Kosmala et al, 2016).

It is also often argued that the sheer level of data which can be processed in these projects and the overwhelming cost-effectiveness afforded by them, often negates any potential researcher bias issues (Gardiner et al., 2012). In 388 citizen science projects assessed in 2014 it is thought that the value of the

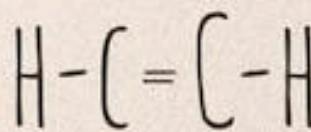
volunteers in regard to usual paid for research hours could have been as high as \$2.5 billion (Theobald et al., 2015).



In 2021 we completed our first run of citizen science projects with a total of 106 hours logged by 3 members of staff, spanning 20 projects in 18 countries. By doing this we have been able to support a wide range of species and habitat types from rhesus macaques in Puerto Rico and pollinator insects in the Arctic through to bird records and tidal patterns right here in the UK.

How do these translate in to conservation?

Especially things like tidal patterns and bird numbers might not scream on the ground conservation. However, the bird records in London covered the 20th Century, allowing researchers to see a hundred years of building development and how this affected wild bird populations in central London. Researchers predicted the work would take 70 years, but 3,076 volunteers did it in just a couple!



List of all Citizen Science Projects Completed by all Office Staff in 2021

| Organiser | Title | Focus | Hours |
|---|-----------------------------|---|-------|
| Aarhus Department of Bioscience | Pollinatorwatch | Plant and insect diversity and population size monitoring in the Arctic. | 9 |
| California Polytechnic State University | Project RattleCam | Female and young rattlesnake observations to identify social behaviours, water sources and predators. | 2 |
| Cayo Santiago Project | Monkey Health Explorer | Counting cell types in rhesus macaque blood from individuals from Cayo Santiago, Puerto Rico to see how health impacts their behaviour. | 1 |
| Enonkishu Conservancy | Snapshot Enonkishu | Population changes and biodiversity monitoring in the Mara-Serengeti eco system, especially in the vicinity of 32 Maasai families. | 3 |
| Fundacion Biodiversidad | Iberian Camera Trap Project | Population changes and biodiversity monitoring in Parque Nacional de Donana, Spain. | 10 |
| Great Salt Lake Institute | PELLcams | Breeding behaviour and nest disturbance amongst pelicans nesting at Great Salt Lake, Utah, USA. | 4 |
| James Cook University | FrogSong | Frog call identification and marking to allow for the development of software to automate this process from very long audio recordings. | 1 |
| London Natural History Society | London Bird Records | Digitising historical bird data within a 20-mile radius of St Paul's Cathedral, London to improve knowledge of bird numbers and biodiversity including the effect which the development of London has had on these. | 3 |
| Max Planck Institute for Evolutionary Anthropology | Chimp & See | Chimpanzee social and behavioural study to support evolutionary science. | 10 |
| NASA | Snapshot Wisconsin | Biodiversity monitoring in woodland located in Wisconsin, USA | 3 |

| | | | |
|---|-----------------------------|--|------------|
| Oxford University | Penguin Watch | Penguin bird, nest, and egg monitoring to assess population change in 100 locations. | 4 |
| Park Hoge Veluwe | Snapshot Hoge Veluwe | Biodiversity and population change monitoring in the Hoge Veluwe National Park, Netherlands. | 3 |
| Permanent Service for Mean Sea Level | UK Tides | Assessing tide data starting from 1860 to monitor tide levels and potential natural impacts around the UK coasts. | 12 |
| San Diego Zoo Wildlife Alliance | Wildwatch Kenya | Giraffe monitoring in Kenya including movements, numbers, behaviour, and other biodiversity around them. | 13 |
| Santa Monica Mountains Fund | Wildlife of Los Angeles | To identify biodiversity and population density of wildlife in relation to levels of urbanization around the Santa Monica Mountain National Recreation area. | 1 |
| Singita Game Reserves | Snapshot Grumeti | Biodiversity monitoring to strengthen support for the continued existence of the Singita Grumeti Game Reserve and Serengeti National Park, Tanzania. | 7 |
| Smithsonian Conservation Biology Institute | eMammal | Data entry checking, identifying, and confirming species ID to allow for behaviours to be attributed to these species for different times of the year comparing wild to captive animals. | 4 |
| Snapshot Safari | Snapshot LEC | Species diversity monitoring in national parks of Botswana. | 1 |
| Taronga Conservation Society Australia | The Greater Bilby Sanctuary | Bilby use of feed sites and water sources during drought periods to allow conservationists to find ways to support threatened species during such times. | 2 |
| University of Minnesota Lion Center | Snapshot Serengeti | Animal health and species diversity monitoring in the Serengeti National Park, Tanzania. | 13 |
| Total hours for 2021 | | | 106 |

All the data above comes from the project descriptions given on the Zooniverse system, which is where we do all of our citizen science work. Projects are chosen based on their relevance to animal and habitat conservation, and then further selected (where possible, but not entirely necessary) to intersect in some way with our species or general work.

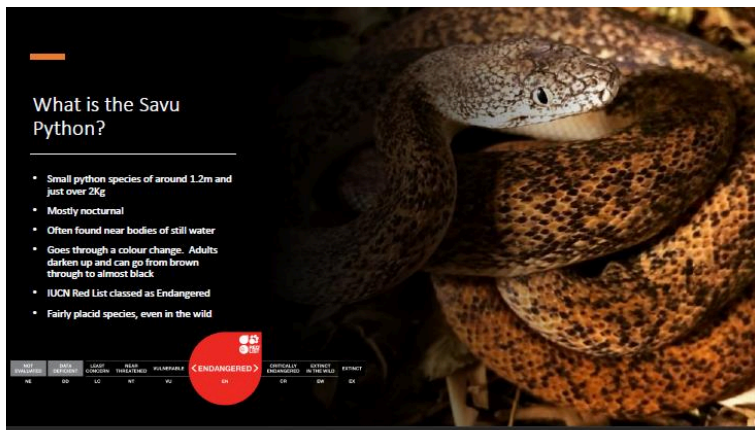
Animals

The very core of what we do is of course the care of our animals and we are incredibly proud of the work which we do with them from a husbandry perspective, and also take great pride in the selection of animals which call Wingham Wildlife Park home. This animal collection contains a number of endangered and vulnerable species, including those which are managed in European studbooks and other management programmes. Below are all 43 managed species which we currently hold.

| EEP Species | ESB Species |
|---|--------------------------|
| Gooty sapphire ornamental spider | Spiny hill turtle |
| Aldabra giant tortoise | Cuban crocodile |
| Gila monster | African dwarf crocodile |
| Mexican beaded lizard | Rhinoceros iguana |
| Humboldt penguin | Savu island python * |
| Pink backed pelican | Blue crowned pigeon |
| Vietnam pheasant | Chattering lory |
| Yellow crested cockatoo | Linne's two-toed sloth |
| Ring tailed lemur | Northern Luzon cloud rat |
| Northern galago | Asiatic black bear |
| Goeldi's monkey | |
| Invasive marmoset | |
| Pygmy marmoset | |
| Emperor tamarin | |
| Red handed tamarin | |
| Cotton-top tamarin | |
| Black howler monkey | |
| Common squirrel monkey | |
| Barbary macaque | |
| Mandrill | |
| Colobus | |
| Bornean orangutan | |
| Chimpanzee | |
| Red panda | |
| Binturong | |
| Southern cheetah | |
| Clouded leopard | |
| Jaguar | |
| Amur leopard (currently held off site at SWP) | |
| Lowland tapir | |
| Visayan warty pig | |
| Giraffe | |
| Blesbok | |

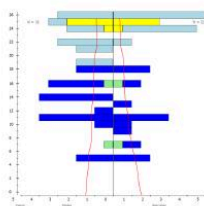
Our involvement with managed captive breeding programmes however doesn't just end with participating in them but extends on to actively being involved with their running. In 2021 we were able to recommend our head of birds, Becky Johnson for a place on the EEP committee for the pink backed pelican, which she was accepted on to. Furthermore, we have continued our work with Markus Wilder, curator at the park, with co-ordinating the ESB for the Savu Island python.

In 2021 more work was done on the studbook report which should be getting published this year following the EAZA reptile TAG midyear meeting for 2022 at which Markus gave a presentation on this beautiful python and the work which has so far gone into the studbook.



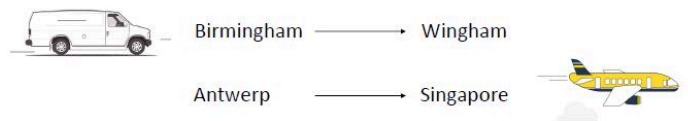
The Studbook Population now

- A total of 28 animals (16.11.1)
- Held at 11 institutions (hopefully soon to be 12)
- Youngest animals 5 years – some unsure ages at top end



Changes Made so Far

- Since taking over the ESB I only just made my second set of recommendations at the end of last month .
- COVID & Brexit have hampered movements and so far the only animal movements have been:



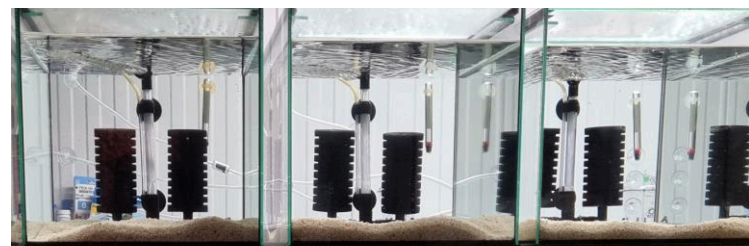
At the ESB level for the Savu python we have gone further than just an administrative role. Especially since Brexit, movements of animals (especially CITES listed animals) have become a little more difficult and costly, so we have been working with other zoos (such as Birmingham Conservation Centre, Singapore Zoo and Zoo Zurich) to help facilitate movements between these zoos in 2022 by physically and financially supporting veterinary & licensing work, to ensure that the work on genetics has real world applications.

crayfish update!

At the start of 2021 our crayfish hatchery became active with water being allowed to mature over the course of 3 months while we organised licensing with CEFAS. The hatchery is now fully licensed to house and breed white clawed crayfish with a lot of safeguards in place to protect both our stock and wild stock from diseases such as crayfish plague.

At the end of May the day then finally came for us to welcome 30 young crayfish from Bristol zoo stock, who were due to be with us for around a year, to be returned to Bristol in 2022. Having never kept this type of animal before it was a tense time, but the team worked very well with the new challenge.

The system runs using recycled rainwater and has a climate control system which allows us to easily and accurately set the temperature of the water as well as the climate outside the water. This species, pound for pound, also has the most expensive diet in the park to ensure that they get all of the nutrients they need (although at the end of the year we were able to cut costs slightly and improve nutrition by swapping supermarket veggies for home grown aquatic plants along with some natural protein from wild invertebrates) and keep them healthy. Our next update will hopefully see these guys living in the rivers near Bristol.



There is one final way in which the animal collection plays its part in aiding conservation, and it is our in-house supplement for the citizen science projects which we do. With some of the projects we run in house we put significant hours into the data collection, whilst also further assisting outside researchers with access to records, questionnaire completion, access to the park for observations and access to samples where these meet ethical considerations.

We further support conservation research by employing a new policy which ensures that any time a post-mortem is performed on an animal which has sadly passed away at the park we will collect a small tissue sample, and if any animal is anaesthetised for a routine or emergency procedure, we will also take that opportunity to take a very small blood sample. No animal is ever caught purely for taking research samples, however if the opportunity arises anyway these samples are sent to the EAZA biobank to support researchers who can carry out genetic sequencing, health monitoring and much more from these small samples.

In 2021 we sent a total of 36 samples from 11 different species to the biobanks in Copenhagen and Edinburgh both for general storage and to support specific projects where certain samples had been requested.

Other research projects which were supported during 2021 (not including our own bird monitoring work, long term chimpanzee behavioural & social networking study or giraffe behaviour and social networking study) include (full details can be found in the zoological research section of our website):

| Institution | Title | Level |
|---|---|--------------|
| <i>BIAZA</i> | Use and Adaption of the BIAZA Welfare Toolkit Welfare Audit Template in BIAZA Member Organisations | Professional |
| <i>Canterbury Christchurch University</i> | Cortisol level analysis in wild cat species of Kentish zoos | Student |
| <i>Copenhagen Zoo</i> | A genetic approach to Cotton Top Tamarin conservation | Professional |
| <i>Prague Zoo</i> | Captive Vietnamese pheasant DNA analysis to evaluate captive pureness and relatedness | Professional |
| <i>University of Bristol</i> | An estimate of cases of urolithiasis in giraffes (<i>Giraffa camelopardalis</i>) and risk factors associated with the disease in European zoos. | Student |
| <i>University of California</i> | Humor and teasing behavior in great apes | Professional |
| <i>University of Cardiff</i> | The influence of management factors on the adrenal activity of captive ambassador cheetahs (<i>Acinonyx jubatus</i>). | Student |
| <i>University of Greenwich</i> | An investigation into whether one to one animal experiences with Meerkats stimulates a stress response in the animal/s taking part, based on behavioural observations and cortisol levels in faecal samples | Student |

The importance of privacy for white clawed crayfish (*Austroptambius pallipes*) in retreat selection in captivity

17th Dec 2021

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Abstract: White clawed crayfish are an important conservation species in European collections with more zoos taking on this species with potential breeding for release projects planned for the future, however in doing so they are often kept off display by these facilities with just small educational displays for the public to see. This species is thought to be a shy one preferring to be kept off display, however it is possible that in doing so that the level of interest which zoos can illicit from members of the public to garner support for the species and the work, is limited. This study looks to determine whether, when given the choice of different areas in the exhibit to hide from both one another and the public or keepers, the crayfish choose to stay hidden away or are comfortable enough to choose a hiding space which is on display.

Keywords: *Austroptambius pallipes*, white clawed crayfish, retreat selection, privacy, display, zoo, conservation, education, husbandry, husbandry, husbandry

1. Introduction

In the last few years there has been a lot of interest in the white clawed crayfish (*Austroptambius pallipes*) in captivity. This is due to the fact that it is an important conservation species in European collections with more zoos taking on this species with potential breeding for release projects planned for the future, however in doing so they are often kept off display by these facilities with just small educational displays for the public to see. This species is thought to be a shy one preferring to be kept off display, however it is possible that in doing so that the level of interest which zoos can illicit from members of the public to garner support for the species and the work, is limited. This study looks to determine whether, when given the choice of different areas in the exhibit to hide from both one another and the public or keepers, the crayfish choose to stay hidden away or are comfortable enough to choose a hiding space which is on display.

2.2 Study design

The study was designed as a series of 10 trials. Each trial consisted of 10 individuals of the same sex and age (approximately 100-150 mm TL) housed in a 100 L tank. The trials were conducted in a dark room with the only light source being the camera used to record the trials.

| Retreat option | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Mean number of individuals | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

| Retreat option | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Mean number of individuals | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

The results of the study showed that the white clawed crayfish preferred to hide in the dark areas of the exhibit when given the choice of different areas to hide in. This was true for all trials and all individuals.

2.3 Results and discussion

The results of the study showed that the white clawed crayfish preferred to hide in the dark areas of the exhibit when given the choice of different areas to hide in. This was true for all trials and all individuals.

2.2 Data analysis

The data was analysed using a series of statistical tests. The first test was a chi-squared test to determine if there was a significant difference in the number of individuals in each retreat option.

| Retreat option | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Mean number of individuals | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

| Retreat option | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Mean number of individuals | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

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The data was analysed using a series of statistical tests. The first test was a chi-squared test to determine if there was a significant difference in the number of individuals in each retreat option.

| Retreat option | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Mean number of individuals | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

| Retreat option | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
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One major piece of research carried out by us in house in the previous year which is worth mentioning in more detail is one carried out by Markus Wilder, titled; "The importance of privacy for white clawed crayfish (*Austroptambius pallipes*) in retreat selection in captivity". This piece of research studied the location preference of our first group of crayfish over a period of a few months to determine whether there were any differences based on whether the rest location was on display to the public or in an area where the crayfish couldn't see people. An abstract for this is below and it is the first completed animal centred project carried out at the park with a full follow up report.

Abstract. White clawed crayfish are an important conservation species in European collections with more zoos taking on this species with potential breeding for release projects planned for the future, however in doing so they are often kept off display by these facilities with just small educational displays for the public to see. This species is thought to be a shy one preferring to be kept off display, however it is possible that in doing so that the level of interest which zoos can illicit from members of the public to garner support for the species and the work, is limited. This study looks to determine whether, when given the choice of different areas in the exhibit to hide from both one another and the public or keepers, the crayfish choose to stay hidden away or are comfortable enough to choose a hiding space which is on display.

Whilst the results are affected by a number of limitations which could benefit from further study, and are discussed as such, it does appear that privacy from visitors does not appear to be the most important factor in the decision-making process for finding the right refuge to spend the day. Husbandry and education benefits of this could be far reaching in allowing breeding centres for this species to work with their individuals on display to the public allowing them to act as ambassadors for the species and local habitats while still being reared and bred in the same setting.

An endangered (Füreder et al, 2010) white clawed crayfish at Wingham Wildlife Park in our hatchery, choosing to sit on top of one of their refuges at the front of the tank. Each enclosure contains several refuges to suit the number of animals in place as well as being size specific to the inhabitants.





Ethics

All of the other work which we do, whether it be breeding animals, running studbooks or investing in cleaning up rivers, would mean nothing if we didn't back it up with our own ethics and ensuring that everything we do at the park, is as ethically sound as it practicably can be.

This is always a somewhat difficult subject to balance when we are also still having to run a business that is profitable in a way that allows us to continue making the park better, letting our staff grow professionally and most importantly actually being able to invest in these projects. If the park does not generate a profit, there is no funding available to engage in these activities and projects in the first place.

However, we constantly strive to improve our policies and processes to have the best possible balance between the two.

Processes which we already pride ourselves as having in place, as discussed in the previous report and continue to be in place include:

Zero to landfill

We have found that when asking people to sort recycling at the park, that this is not always followed properly, which may be due to children not understand or foreign visitors not being able to read the signage on top of convenience to just putting everything in one bin. As a result, when recycling is “contaminated” our recycling companies would not take the waste. We therefore made the decision to not sort our recycling but instead pay our waste sorting company to do so on arrival with them. We use a zero to landfill service and have stickers on bins which explain this, however some of these could possibly do with being replaced.

Composting

Our industry naturally creates a large volume of compostable waste, from animal feed waste (when fresh produce or browse based) to plant cuttings as well as animal waste and used animal bedding. We have a purpose-built composting area at the front of our park where we are able to easily and safely process this waste to produce compost which we can use in the park for our many garden elements or allow locals to use when we are approached by interested parties.

Building practices

We pride ourselves on being the fastest growing wildlife park in Kent, which means that we are constantly expanding and always building. Something which we have been focussing on over the past few years is ensuring that our building practices are sustainable both in the production methods and the long-term implementation. This means that when ever we have a building which is being heated, we ensure that we use high quality insulation both in the ground as well as above ground, or selectively using double glazing windows, even indoors if it is in a draught from an open door. Equally when building we ensure that things like timber products are FSC certified.

Sustainable heating and energy sources

At our park we use sustainable energy practices in 2 distinct ways. The first of these is the use of sustainable sources to produce electricity which can be used for a variety of applications, with excess sent back to the national grid, and secondly by powering our heating systems directly.

Ground Source heating

This is a method of heating water by using the higher ground temperature reached by boring underground and then sending this heated water back to a boiler where the end temperature is regulated either by cooling or using an energy efficient boiler to help top up the heat. This water is already heated when it gets to the boiler so requires very little energy to provide the top up heat when needed. We were originally sceptical about this method however it has turned out to be a very efficient system.

Biomass boilers

The most efficient way of using sustainable sources to produce heating is through the use of biomass boilers. To begin with, the process of burning wood in a furnace appears to be a source of heating which is detrimental to the environment. However, by using highly efficient burners with specialist air cleaning components, the waste products produced in the form of carbon dioxide are lower than the volume of carbon dioxide which the trees used in the production of the pellets are able to process. Fast growing trees are used to produce these pellets to maximise the volume of carbon dioxide cycled through the growth and usage system as a whole.



As the burners work so efficiently, they also produce only a very small amount of solid waste in the form of wood ash, which we are able to add to the compost to improve the soil composition even further with trace elements such as potassium being added while also helping to reduce the acid content of the resulting soil.

Solar energy

The most well known of our sustainable energy sources is of course the sun. Solar power is nothing new, but over the last few years it has become increasingly more affordable and compact. We use a large number of solar panels on the play area building and are always looking into new ways in which we can use this power source. It has absolutely no waste and is truly sustainable with no impact on the environment at all.



Supermarket waste

In the past 10 years or more we have received almost all of our fresh produce for the animals from supermarkets as their “out of date” or damaged waste. In the past this has meant that we would go out 5 to 6 times per week to fill a van each time with fresh produce, and this continued until 2 thirds of the way through 2021. However, we made the decision at the end of the year to cease this practice for a number of reasons.

From a business perspective we were spending a minimum of 40 to 60 staff hours per week on collecting and then sorting the fruit and vegetable products. From the animal point of view this meant that we had no control over which fruits and vegetables we received. The quality had recently also decreased for animal organisations picking up this kind of produce. As supermarkets have started to work more closely with food banks for communities this has meant that what is left for animal feed is the bottom of the barrel waste and we had started to throw away (in the compost heap) more produce than we were feeding out.



As a result we now travel to London once every 7 to 10 days (which has also decreased our fuel consumption) to buy fresh produce from the market where we can get a lot of locally produced fruits and vegetables, give our animals seasonal variety, great quality and in some cases more exotic fruits and vegetables as a treat.



We have however retained one supermarket for their produce waste, which is the co-op in Sandwich who donate some times once or twice per week (or maybe even more depending on the circumstances), which again gives us a little variety and allows us to continue to help with at least a small portion of food waste management in the local community.

Recycled benches

Some years ago we made a pledge to no longer use wooden benches. Whilst wooden benches, if made from FSC certified materials are also sustainable, what we like about the plastic benches from Marmax products is that they are made from recycled materials and as such, along with being sustainable, we are also helping to take plastics out of circulation. Most of this type of work for us is centred around the benches, however we do also, when we can, use recycled plastic decking boards. However, we have found that in general, wooden decking boards still retain a higher level of slip resistance for visitors so only use it selectively at the moment.

Rainwater use

As mentioned before when it comes to new projects we try to be as sustainable as we possibly can be, and that extends to our water usage as well, however for an existing company this can be very difficult to achieve. In an ideal world it would be great for us to be able to instal underground storage tanks for rainwater as we have so many large rooves which we could collect from, however the reality is that in terms of space and manoeuvrability around buildings, this is currently just not feasible. However, on a smaller scale we do collect rainwater for our crayfish hatchery by using smaller collection barrels and then moving this water in to indoor storage tanks where the water is circulated and filtered until it is ready to be used. This water is then also used to water the gardens and as such goes through an extensive cycle here at the park, covering 2 otherwise mains water related jobs before returning to the ground water.

Gift shop sustainable toys

Whilst we are still being held back significantly by an unwillingness to accept and adopt changes to material procurement in the toy industry we will continue to try and source plastic toys which are made from recycled materials, or for that matter high quality plastic alternatives like wood and diecast toys. However, our biggest initial strides continue with the recycled plush range where suppliers have a much better grasp on the need for recycled materials. On a positive note with these, they are also incredibly popular with customers, look very good, are competitively priced and mostly suitable for babies as well due to the types of eyes used.

Palm oil policy

One of the things which we have been doing is the use of posters which are being distributed as of next year to help companies follow our advice about using sustainable palm oil. These posters are based off of our own work and of course we cannot expect other people to follow these guidelines if we do not follow them ourselves. As such we have an extensive palm oil policy which includes procurement and the criteria which we look at to ensure that we use only the highest quality and ethical producers.

This full policy can be seen on the following pages and is also freely available on our website.



cuddlecoTM
100% Recycled. 100% Huggable

Sustainable Palm Oil Usage Policy

It is thought that palm oil is represented in around 50% of packaged food goods, and thanks to EU legislation in 2011, companies must state in their ingredients not only that they are using vegetable oil, but to specify which type. However it is still possible for palm oil usage to be disguised using terms such as:

Palm oil kernel, palmitate, cocoa butter equivalent (CBE), cocoa butter substitute (CBS), palm olein and palm stearin.

If terms such as the above are used, there is a fair chance that their attempts to disguise their use of palm oil will equate to them not using a sustainable source of palm oil. Sadly most companies don't advertise clearly that they use palm oil from sustainable sources and as such it can be difficult to make an informed decision.

This is however a subject which we are passionate about and as such in 2018 changed our policy to actively seek out documentation from all of our food suppliers to be able to trace our palm oil usage.

As a result we are able to confidently claim that as of 2018 our catering facilities use sustainably sourced and certified palm oil in 100% of our products. Please read our sustainable palm oil use policy below to see how we have done this:

Sustainable Palm Oil Use Policy

Last Updated 25th August 2019

What is palm oil?

Palm oil is a vegetable oil which is derived from the fruit of the oil palm (usually the African oil palm, American oil palm or maripa palm). The two types of palm oil are palm kernel oil which is extracted from the central seed / nut of the fruit and palm oil which is extracted from the pulp of the fruit.

Why is palm oil considered to be so bad?

Palm oil is considered to be a negative by various organisations and people, for a variety of reasons. We will just be looking at the environmental impact.

As demand for this oil has increased as both a cooking oil and as a bio diesel, plantations have been popping up and replacing the rainforest in all tropical countries. When you fly into places such as Kuala Lumpur for example, from the sky you approach a beautiful, lush green paradise, and it is only on closer arrival that you notice that it is palm plantations as far as the eye can see. You wonder to yourself why it is so bad to have this lush vast landscape, until you realise that barely anything nests in these trees and barely anything can eat the fruits and leaves. Having stood in such plantations ourselves, just a few miles away from the rainforest, the difference in the sounds you can (or can't) hear is astounding. Oil palm plantations look beautiful but are devoid of most wildlife.

it is not just the long term affects of the plantations being where they are which are a negative associated with the process, but to plant these palms, acres upon acres of rainforest are cut or burned to the ground with no regard for the animals which may still be in these areas of the forest.

How is sustainable palm oil different?

Sustainable palm oil is exactly the same product however it must adhere to a number of rules to be classified as being sustainable including being given specific licenses by the government for the land use, minimising environmental impact, supporting wildlife crossing through or living around the plantations and using old farmland rather than converting areas of forest. This last one is the most important and impactful.

Shouldn't we just ban palm oil?

This seems like the logical step if production is so harmful for the environment, however it is possible that other vegetable oils could be even more harmful. In terms of productivity levels per hectare of crop, oil palm is the most productive vegetable oil crop available today with the next one behind this being coconut, which is only 45% as productive as oil palm. Soybean oil (which has around 23% of the vegetable oil market, often grown in the USA) fares even worse, being only 7% as productive as oil palm.

There is the argument that these crops can be grown elsewhere in the world and as such production would not be limited to tropical countries, however if palm oil were banned, these producers would need to grow something else instead, taking up even more rainforest space.

Finally it is such a huge part of the economy in the countries who produce it that even if the UK, Europe or even a combination of Europe and the USA were to ban the products, the Asian market is still the largest in the world for the consumption of palm oil, and this market is unlikely to be banned locally.

Palm oil is the lesser of many evils, and the focus needs to be on making current palm oil practices as sustainable, controlled, accountable and productive as possible to ensure that the damage which the industry has made remains stable where it is and does not get worse.

What is Wingham Wildlife Park doing to help?

Wingham Wildlife Park only uses products which contain either sustainably sourced and produced palm oil, as certified by the RoundTable on Sustainable Palm Oil or which use alternative (and still sustainably sourced – such as local alternatives) vegetable oils.

However, we go one step beyond this and not only look at the certificate but also at the application which these companies send to RSPO where they have to declare how much of their palm oil is sustainable and how much is not. We do not assume that because a company is certified that 100% of their palm oil is sustainable, as this is not the case.

What we do is look at the RSPO Annual Communications of Progress and find section 2.2.5 which will tell us all of the palm oil and palm kernel oil which they used for that year. We then go to the next page and look at the table 2.3 and add up the figures in rows 2.3.3 and 2.3.4 (telling us how much mass balanced palm oil & palm kernel oil and how much segregated palm oil & palm

kernel oil they used in that year). This number should be equal to the number in 2.2.5. If it is not, then it means that less than 100% of their palm oil is sustainable.

Example:

Nestle in 2017 submitted a report which stated that they used 459,236 tonnes of palm oil and palm oil products in that year (315,099 tonnes of palm oil and 144,137 tonnes of palm kernel oil). They then said that they used 82,801 tonnes of segregated palm oil and 6,430 tonnes of palm kernel oil making a total of 89,231 tonnes of sustainable RSPO certified palm oil in that year. This only accounts for 19% of their palm oil used.

As a result we do not stock any products by Nestle which contain palm oil and why we stopped selling our best selling chocolate bar, the Kit kat.

We are also supporting a campaign by Wingham Wildlife Park Animal Welfare (WWPAW), registered charity number 1162346 to firstly encourage the UK's major supermarket chains to only use 100% sustainable palm oil in their products using the method given above, and secondly encourage the RoundTable on Sustainable Palm Oil to change their certification standard to make it easier for consumers to know how sustainable their purchases are.

This campaign is done using an online form which people can complete and automatically send an email to these organisations on behalf of members of the public. We host this online system for them on our website.

What more does Wingham Wildlife Park aim to do for the future?

At the moment we count mass balance as acceptable in our sustainability policy however feel that it is simply an excuse which does not tackle the problem. It allows companies to use a mix of sustainable and unsustainable palm oil, paying an extra levy on the unsustainable palm oil allowing that sustainable palm oil to be used elsewhere at a lower rate, again as mass balanced. It is thought that this way all of the sustainable oil is still used to encourage sustainable growers, however also does not do anything to discourage the unsustainable palm oil, allowing users of palm oil products to take the "easy route" as opposed to the "moral route".

Once more work has been done to make people and companies aware of this through our work with WWPAW we wish to remove mass balance from our stocked items, however at present this is proving too difficult to do, especially when working alongside our plastic policy. We are trying to decrease our single use plastic usage and at present the only companies selling cakes with only certified segregated palm oil for example are those which are individually wrapped.

Balancing business and sustainability is a difficult juggling act and we hope that through our advocacy work with WWPAW that this juggling will become easier and more practical.

What can you do to help?

For the average consumer it is very difficult to know just how sustainable your goods are, however, a great place to start is to look for the RSPO logo on items you're buying or to search for RSPO members on their website.



Look out for this logo next time you do your shopping!

Whilst palm oil plantations look beautifully lush and full of life, the reality is that just because it's green, doesn't mean it's edible and the majority of animals living in the area where the palm oil is grown do not feed on the plants or fruits being grown in this area. These plantations are often also a hive of activity as they expand or the products are processed. All of these mean that whilst they are lush and green, these fields of palm trees are almost totally devoid of life. Having visited an old plantation myself which lacked the human element but still had all of the trees in place, you could barely hear any birds or insects - shocking when an hour earlier we had been just up the road in a protected forest filled with deafening cicadas.

However, palm oil has the highest yield per acre out of all the vegetable oils by a long way. If these were to be replaced by coconut, olive or rape plantations, to produce the same level of stock they would need to deforest even more areas of rainforest. So the focus needs to be not on using alternative oils but on properly licensing and encouraging the sustainable and ethical production of this oil.

green & lush
doesn't mean
full of life!

Our Achievements & Impact Summarised for 2021

| Achievement | Impact |
|---|--|
| Habitats | |
| <p>Bird nesting and feed site production has increased drastically, especially in the bug garden area where we have added 2 fat ball feeders, 2 bird baths, 18 nest boxes and 8 roost areas.</p> | <p>Whilst we won't know the true impact until next year when we will have our second full year of bird statistics according to the closest documented estimates our wild bird species increased from 37 to 38 between 2017 and 2021.</p> |
| <p>We dedicate part of the bird team's day towards keeping record of all of the birds they see during their work day and even invested in 1 member of staff who was not so clear on native bird species to complete an online training course on British bird identification and field skills. This also included the purchase of written identification materials for the whole team to use.</p> | <p>In 2021 we were able to gather species data (and in some cases also basic behaviour data such as nesting and feeding behaviour) for 51,934 birds at our park over a 6 month period. 18 species took advantage of our feeding opportunities, while 3 species had active nests found by staff, although even more do appear to use the site for nesting as we observed 12 species stay at the park (usually for a prolonged time) with juveniles, as we provide a safe place for them to rear their young.</p> |
| <p>Completed our first internal BioBlitz with the help of our education team and a group of cub scouts from the local community. We provided equipment for identifying terrestrial invertebrates, catching aquatic invertebrates and guides for identifying wild birds and invertebrates at an intermediate level.</p> | <p>We also know that during the BioBlitz event we found 48 species in total, with 487 individuals being found, identified and re-released on our grounds with 20 budding young environmentalists from a local scout group being awed by the variety they found.</p> |
| <p>Environmental DNA collection was aided by 3 members of staff at 4 different sites around Dover and Canterbury to look specifically for white clawed crayfish, signal crayfish and crayfish plague in these areas.</p> | <p>The sampling which our team carried out was part of a larger project of 10 sites. In total the 4 sites sampled by us found no evidence of white clawed or signal crayfish at all, however one site was found to have been positive for crayfish plague. 2 of these sites (one of them positive for plague) are unlikely to support crayfish due to poor habitat as found during a survey carried out at the same time as the sampling. However, 2 of the sites are currently not testing positive for anything and are potentially good crayfish habitat and as such warrant further investigation. Furthermore 2 of the potential ark sites were found to be positive for crayfish plague so are</p> |

| | |
|--|--|
| | <p>to be re-considered whilst 1 new potential ark site was found to be negative across all parameters but with potential for good habitat whilst one further site was found to already be home to white clawed crayfish and as such should be considered for more protection from signal crayfish and crayfish plague.</p> |
|--|--|

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|---|--|
| <p>Supported World Land Trust with £643.22 in financial donations to be used specifically for their Khe Nuoc Trang reserve work in Vietnam. Sadly the donation was impacted greatly by having been shut over the Easter period due to COVID restrictions, as this particular donation is largely collected from the public.</p> | <p>The Khe Nuoc Trong reserve has been recognised as a national protected area of Vietnam by the government, something which was facilitated through the regeneration work being carried out by World Land Trust and their local partner, Viet Nature. Our funding helps to pay towards their regeneration work through ecosystem restoration, sustainable resource management with the local communities, biodiversity monitoring, environmental education and advocacy for local biodiversity conservation with the local and national government.</p> |
|---|--|

Communities

| | |
|--|---|
| <p>Designed and printed the first batch of posters with our guide to sustainable palm oil product procurement.</p> | <p>This has been preparation work for the coming year, and we will not know the impact that these posters have had until 2022 at the earliest. We are likely only to find out the uptake level for these posters and will evaluate whether there are other ways to measure impact in a meaningful way. It is likely that follow up questionnaires will be ineffective and biased towards the people who want to take up the offer, however as people need to go out of their way to apply for these, we do know that there is already an interest in the subject.</p> |
|--|---|

| | |
|---|---|
| <p>We have supported the scientific community directly by giving access to our park, our animal collection and staff for 8 researchers / research teams at a level of undergraduate university students at a minimum.</p> | <p>At present none of the work we participated in has been published so we cannot gauge how many people have been able to take advantage of the information which has come about from this work, however we have had some reports returned to us and are aware that others are still being worked on, allowing us to eventually</p> |
|---|---|

We have supported 20 citizen science projects with a total of 106 staff hours around the world (in 18 countries in total) to aid with data processing on the topics of a number of different habitat types as well as a very wide range of species.

We supported and continue to support the EAZA BioBank (for these purposes in 2021 in particular through the BioBanks held at Copenhagen Zoo and Edinburgh Zoo) with a total of 36 biological samples including liver tissue, blood, hair and feathers.

potentially use some of this information within our own work ethics.

We have been able to help with the understanding of:

- Captive husbandry work and how to potentially improve this field for 11 vulnerable to extinction species (continuing in house to further understand our own husbandry of 2 of these as well as 1 further endangered species).
- Worked towards an understanding of how we can improve the way in which people in our park learn about invertebrates and their conservation.
- Helped build a better understanding of the current genetic health of the captive and wild populations of 2 endangered species.

Animals

We have 1 member of staff as an active member of an EEP committee for the pink backed pelican.

Our participation at a number of levels in managed species programmes on behalf of EAZA or as part of the EAZA network has allowed us to take a pro-active approach to how the species in our park are managed for conservation.

Conservation work with these species is not as simple as breed as many as we can for release - in fact it is far more complex and in many cases focuses more on the control of selected breeding to ensure that we retain the highest genetic integrity we can in our captive populations.

We have 1 member of staff who is the co-ordinator for an ESB for the Savu Island python, entering their second year of managing the programme and organising it as well as possible to aid its potential adoption as a new style EEP in the future.

Our work at studbook management level has allowed one of our keepers to gain an understanding and active role in the pink backed pelican EEP while our curator has been able to facilitate the movement of several specimens of the Savu Island python around zoos on a global management level as Singapore Zoo is part of this programme. The Savu python is one with a very skewed age pyramid and genetic distribution, and we will see in the coming years whether our work at a management level can help to improve these.

We hold a total of 48 species which are part of a managed EAZA population in both breeding and non-breeding groups depending on the needs of the studbook and wider population.

Impact when working with other managed programmes within the park can be a little more difficult to measure, however between the 48 managed species which we keep, for all of these, including non-breeding recommendation species, we played an active part in housing part of the European genetic population and also working with these animals as ambassadors for their wild counterparts. Amongst these we did however have 1 birth in a managed programme. Whilst it was a slow year for breeding due to our transition in to the EAZA association and dealing with the financial strain of COVID it was great news to welcome a baby Goeldi's monkey at the park. Some other new or maturing groups we hope will have success in the coming years, with a new red panda male on his way and the black howler monkey group settling in together well and showing breeding interest.

Ethics

We have continued to use and maintain renewable energy sources at the park with 3 main types being used:
In our reception building we use ground source heat pump to power the under floor heating. For the park as a whole we use solar energy with any unused remainder being sent back to the national grid. This bank of solar panels is located on the indoor play area.
Finally to power the heating systems in the giraffe building, chimpanzee building and the indoor play area & offices we use bio-mass boilers.

A combination of modern sustainable building techniques and these heating systems means that we have managed to produce our own energy for heating, with the following consumption values having been produced in this way through 2021, rather than from non-sustainable external fuels:
First we have the biomass heating systems which use sustainably produced wood pellets to heat boilers, allowing the heating system to draw on this heated water:
Indoor play area; 402,498 kWhth
Chimpanzees; 452,320 kWhth
Giraffes; 156,183 kWhth
Secondly we have a ground source heat pump which again uses heated water to power the underfloor heating system in the reception / gift shop / restaurant building. The water is heated by pumping it under ground in a field next to our car park where the higher underground temperatures change the water temperature. This is then if needed topped up with a conventional boiler, but still produced the following values from our 30kW system:
43,296 kWhth
Thirdly we use a slightly different approach as well, by having a renewable energy source

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| | <p>which does not merely heat our buildings but actually produces electricity to be used in other parts of the park. On the roof of the indoor play area we have a bank of solar panels which in 2021 produced: 31,843 kWhs</p> |
| <p>We have continued our strong progress started in the previous year when we pledged to replace 100% of the plush stock in our gift shop with recycled plush products. Our pledge was to do this by the end of 2025 and we are still working to ensure that we reach that deadline with ample time. The main thing holding back the distribution in our shop at current is pre-order / in stock and personalised stock.</p> | <p>In the 2020 season is when we first started to really look at the eco plush ranges and we want to work with only 100% recycled plush. As such what we haven't included in these numbers is plush products, such as those sold by PetJes which are stuffed with 100% recycled material however are still made on the outside (including the eyes and noses) using virgin materials. The numbers below are only those items in our shop which were stocked and sold during 2021 where 100% of the production materials are recycled (whether it be plastic fibre or even recycled cotton from old clothing). During this time, we stocked 244 different lines of plush toys in our gift shop and of these 64 lines were 100% recycled, making this 26% of our plush lines in 2021. As this was our first full year or making our pledge to work towards 100% recycled plush products, we feel this is a great start. The eco ranges are not always the most popular lines so when drilling down to actual products sold the percentage drops to just under 10% of our sales which totalled 163,631 individual plush items. As a result however we were still able to pull 15,741 individual products out of the virgin material market and in the process helping to recycle a huge volume of plastics and fabrics.</p> |
| <p>We are able to save water which would have to come from the main system by harvesting it in barrels for use in our crayfish hatchery. When this water is then changed out periodically (as long as we do not have any signs of disease in the system), it is used to water some of the plants in the garden, which would otherwise be watered using mains water.</p> | <p>With this combined water saving method which cycles the rainwater which would usually be lost to the ground water any way, through 2 separate purposes here at the park and is then sent back to ground water where it would have ended up with the rain anyway. In doing so in 2021 we put approximately 1,985 litres of water into the hatchery system when it was first set up, followed each week with a 10% water change over an 8 month usage period (the first few months of the water being in situ were to allow it to mature ready for the crayfish to arrive and so underwent no water</p> |

changes). In doing so we put a further 6,350 litres through the system.

As a result, we saved approximately 8,335 litres of mains water just in the hatchery. When the water was then used again for watering (as there were still 1,985 litres left in the system at the end of the year and accounting for small levels of spillages) we ended up using around 6,000 litres of water for irrigation.

In total, the volume of water which was saved from coming from mains water and being wasted, by double recycling rainwater was equal to approximately 14,335 litres.

While continuing to work with only recycled plastic benches we added a small number of new benches to the park this year totalling 13 benches / picnic tables, with this being a practice we are dedicated to continuing for all required benches moving forward for the park. These are produced by Marmax recycled products who guarantee that these benches are produced from 100% recycled plastic products.

In 2021 we purchased 1 new sloper bench (which was purchased as a memorial bench for inside the park) which saves the equivalent of around 910 x 2 pint milk bottles.

On top of this we also purchased 12 picnic tables each of which saves around 2,731 x 2 pint milk bottles.

In total this means that the equivalent of around 33,682 plastic 2 pint milk bottles were taken out of the waste cycle and landfill as a result of these benches having been produced for us.

In terms of weight this is equal to a massive 1,195.5 Kg of waste plastic which is not going to end up in the ocean or buried in the ground for the next few hundred years, instead producing a colourful place for children and families to sit and have their lunch while using our new play area.



Plan changes since 2020

A phrase which has always stuck with me from secondary school, and it is one which I think should be remembered more often, is from the 1785 Robert Burns poem, "To a Mouse", although a slightly modernised version there of:

*"The best laid plans of mice and men
often go awry."*

As much as we may wish to work with certain projects or species, it is only natural that there is a chance of these plans changing or having to be cancelled altogether. Below is a summary of the projects we had been planning to contribute towards or work with but have for one reason or another not come to fruition. I will not focus heavily on what their replacements will be as those will be covered in our future plans section to follow.

~~Operation chough~~

We had hoped to work with the "Operation Chough" project working with the release of native choughs, with one of the release sites being the cliffs of Dover. We are the closest zoo to this area and as such seemed like the perfect project for us, and we earmarked an area of the park to act as a breeding centre. The southeast running of the project has been handed over to the Wildwood trust who currently have no need for another partner which is a shame for such a local project.

~~Medicinal leeches~~

Having worked with medicinal leeches for some time now in our invertebrate house it has come to our attention that the temperature ranges will not be conducive for breeding but work very well for display animals. As such we will continue to display them in the bug garden but will not be looking to join the national breeding project, which already has several partners.

~~Vietnamese pheasant~~

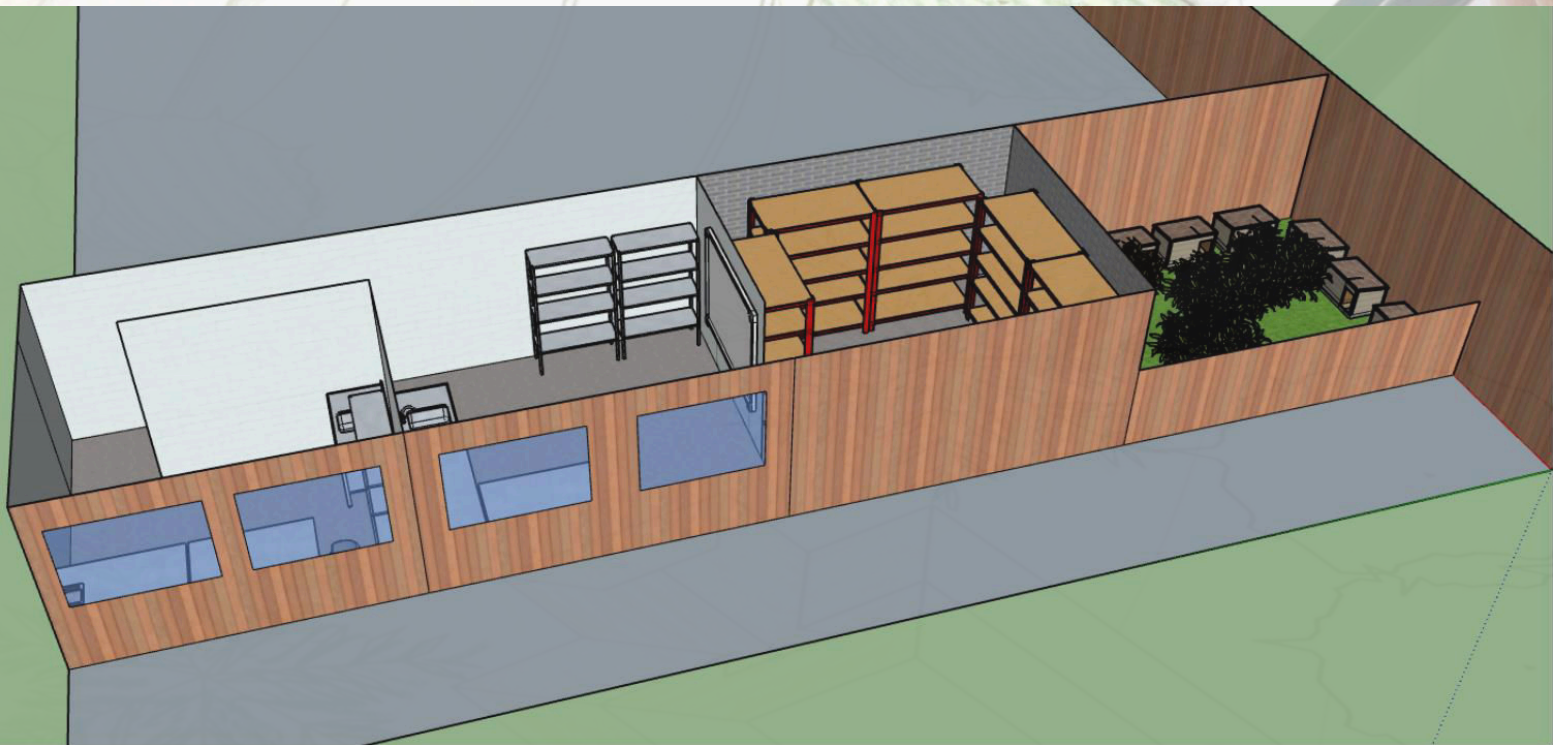
This is a project which has not so much been cancelled altogether but certainly been delayed by an undefined length of time. Due to unknown origin our birds are currently non-breeding individuals in the studbook, however we have supported the EEP by sending DNA samples to the EAZA biobank for analysis to determine whether ours are Edward's or Vietnamese pheasants (or a hybrid of the two). The EEP is of course looking to only work with pure animals for release. However, we will continue to work on using these individuals as ambassadors for this species, looking to take up the breeding mantle again in the future. This date will be much sooner if they come back as being pure animals.

Plans for 2022 & Onwards

Following on from the plan changes seems like the perfect place to introduce our work for 2022 and onwards, especially as it includes one last change from our previous plans, which is our planned work with hedgehogs.

In our last report there was no mention of hedgehogs as a standalone project, however, soon after that report we decided to add this species in to replace the chough project. There was going to be a hedgehog hospital put in place of the chough breeding project. But, having read the proposed planned changes to the zoo licensing conditions we decided that housing hedgehogs in the park boundary was going to become problematic in the future. As such there will be some changes, which include the proposition of utilising the old farm shop building at the park entrance to act as a hedgehog housing and rehabilitation centre.

This will allow us to take in sick and injured hedgehogs, house them away from our animal collection to nurse them better and then allow us to re-release them at a suitable time and location. This plan will require some changes to be made, however the original plan was as follows featuring a veterinary room, housing area and a dedicated kitchen and storage area, with the temporary inhabitants having 100% privacy for the duration of their stay, with just food prep areas and the veterinary room (when not in use) being on display. The actual centre if moved to the old farm shop will feature even higher levels of privacy than it would have had in the park.



The new centre would equally share some of these features but will actually leave even more space for housing. The original house would have allowed for a space 4m x 4.5m for hedgehog housing, while the new area could allow for a kitchen, storage room, veterinary room and still have access to around 7.5m x 9.5m of open space which can be utilised for housing hedgehogs and even potentially allowing us to split them down to releasable as well as some permanent / long term residents depending on their health condition.



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An example of a species where we sometimes need to focus less on the IUCN red list (or the bigger picture), where the European hedgehog is classed as least concern (Amori, 2016), and look closer at how they are doing here, at home! In the UK they are a red listed mammal heading towards (at least local) extinction. There are thought to be up to 1.55 million hedgehogs in Great Britain (Harris et al, 1995), which may seem like a lot, but consider that they have decreased by around 25% in just the last 10 years (Wembridge, 2011), and the picture looks far more bleak. That's a population decline of almost 400,000. How will the population look in 10, 20, 30 years from now?



Our other main conservation plans for 2022 and onwards are currently as follows:

1. Get some concrete plans in to place for where to place the hedgehog hospital and how the area will be set up and run by the end of 2022. Due to other work being carried out still in the park itself (such as the reptile house renovation work) it is unlikely that physical work on this hospital will start until 2023 at the earliest.
2. Continue our work towards using only sustainable forestry commodities in all our supply chains by the end of 2023.
3. See a 66% decrease in the use of single use plastics amongst our drinks sales by the end of 2022 with this to be increased in 2023 as drink dispensers being installed Easter 2022.
4. Continue to support Bristol Zoo with their crayfish population while we continue our habitat testing and improvement works in Kent. This will likely continue until 2024 - 2025 while Bristol Zoo works on their Wild Project site following their closure of Bristol Zoo, due to happen at the end of the 2022 season.
5. Carry out our own work to support white clawed crayfish in the Kent region by looking very locally at the water sources around the park to ascertain as to whether any of these have the water quality and habitat types needed to support this species.
6. Extend our very successful bird recording system to also cover invertebrates, especially in the bug garden area.
7. We have produced the signage for "wild birds at WWP" and now need to continue this work to put this signage in place which we hope to do in 2022.
8. Continue discussions with Viet Nature to hopefully have a second project of theirs to support on the ground alongside our support through WLT. Whilst we are having to work at their speed with this, we hope that we can have some ideas in place at the very least by the end of 2022 - it is unlikely that work on the ground will start before 2023.
9. Increase citizen science support from 2 to a minimum of 3 hours per week.
10. Update signage around the chimpanzee collection box at the park to showcase a wider range of our conservation projects.
11. Be involved, at least at committee level in a minimum of 1 more new style EEP at the EAZA level. At this point, Ruth Wilder, the head keeper at the park has already been put forward as a potential member of the mandrill EEP committee and we await that decision.
12. Actively participate in the EAZA21+ conservation campaign.
13. Calculate our carbon footprint to allow us to better manage our energy consumption.
14. Continue our current great work to ensure that we stick to our target of stocking only recycled plush toys in the gift shop by 2025. We will also continue to try and source recycled plastic alternative for other toy lines.



How to Help

If you want to help us continue to do the work we do and continue to find new ways for us to get involved with conservation, the best way to do so is to continue to support the park. What better way to support wildlife conservation than by enjoying some wholesome family time surrounded by the beautiful, happy animals at the park. By purchasing day entry tickets, membership passes, animal experiences, animal adoptions and getting involved while at the park, you help us with every pound you spend.

However if you wanted to do more there are plenty of ways to get involved:

- Get involved in a fund raising event of your own (such as a fun run, sponsored silence, 24 hour live stream, 3 peaks challenge etc. the number of things you can get involved in is limited only by your imagination).
- Adopt an animal at the park.
- Sponsor an animal or enclosure in memory of a loved one.
- Leave a legacy donation in your will.

In the past year a number of our staff members have been busy taking part in a variety of fun runs, taking full advantage of these types of events once again becoming accessible as COVID restrictions started to ease. Between them, Tony, Jackie, Jo, Laurice and Markus took part in mud runs operated by both Nuts Challenge and Nuclear Races, as well as an inflatable obstacle colour run.

Markus also went on to raise funds for the crayfish project by cycling 107Km along the path of the river stour while one of our supporters, Jenni Davis helped raise funds by taking part in the London marathon on our behalf. 2021 was certainly a great year for getting fit in order to help raise money for conservation.





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| NOT EVALUATED | DATA DEFICIENT | LEAST CONCERN | NEAR THREATENED | VULNERABLE | ENDANGERED | CRITICALLY ENDANGERED | EXTINCT IN THE WILD | EXTINCT |
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