PROGRESS RAIL
BIODIVERSITY REPORT
2020

Progress Rail
A Caterpillar Company

Introduction

2020 was our 7th year of biological recording at our South Queensferry site.

Covid 19 restricted our Nest survey this year but enough information was gathered for recording purposes.

Several new specialist bird boxes were introduced .

Amphibian monitoring continued with mixed results.

Areas for pollinators were enhanced.

One of our first spring flowers Primrose growing on the east bank area.

FRONT COVER – Tree Sparrows collecting nest material early in March.

Habitat

Habitat management continues, with improvements to the areas set aside. Wild flowers introduced over the years are now well established in some areas, Devils bit scabious, Red campion, Teasel, Foxglove and Yellow rattle being the notable species. Young tree saplings of Horse chestnut, Oak, Hazel, Willow now have a good foothold in the south boundary area all have grown naturally, Oak and Hazel with the help of our local Jays. The areas set aside for pollinators were planted up with more flowers.

We also introduced some Gorse (Ulex europaeus) to the north facing south bank with some success. Gorse provides excellent nesting habitat for Linnets, Yellow Hammer and Stonechat.

One unusual flower was Jimsom weed that turned up growing beside the bird feeder

Jimsom Weed (Datura stramonium)

Datura stramonium, known by the common names thorn apple, jimsonweed or devil's snare, is a plant species in the nightshade family and Datura genus. Its likely origin was in Central America, and it has been introduced in many world regions. It is an aggressive invasive weed in temperate climates across the world. D. stramonium has frequently been employed in traditional medicine to treat a variety of ailments. It has also been used as a hallucinogen, taken entheogenically to cause intense visions. It is unlikely ever to become a major drug of abuse owing to effects upon both mind and body frequently perceived subjectively as highly unpleasant, giving rise to a state of profound and long-lasting disorientation with a potentially fatal outcome. It contains tropane alkaloids which are responsible for the deliriant effects, and may be severely toxic.

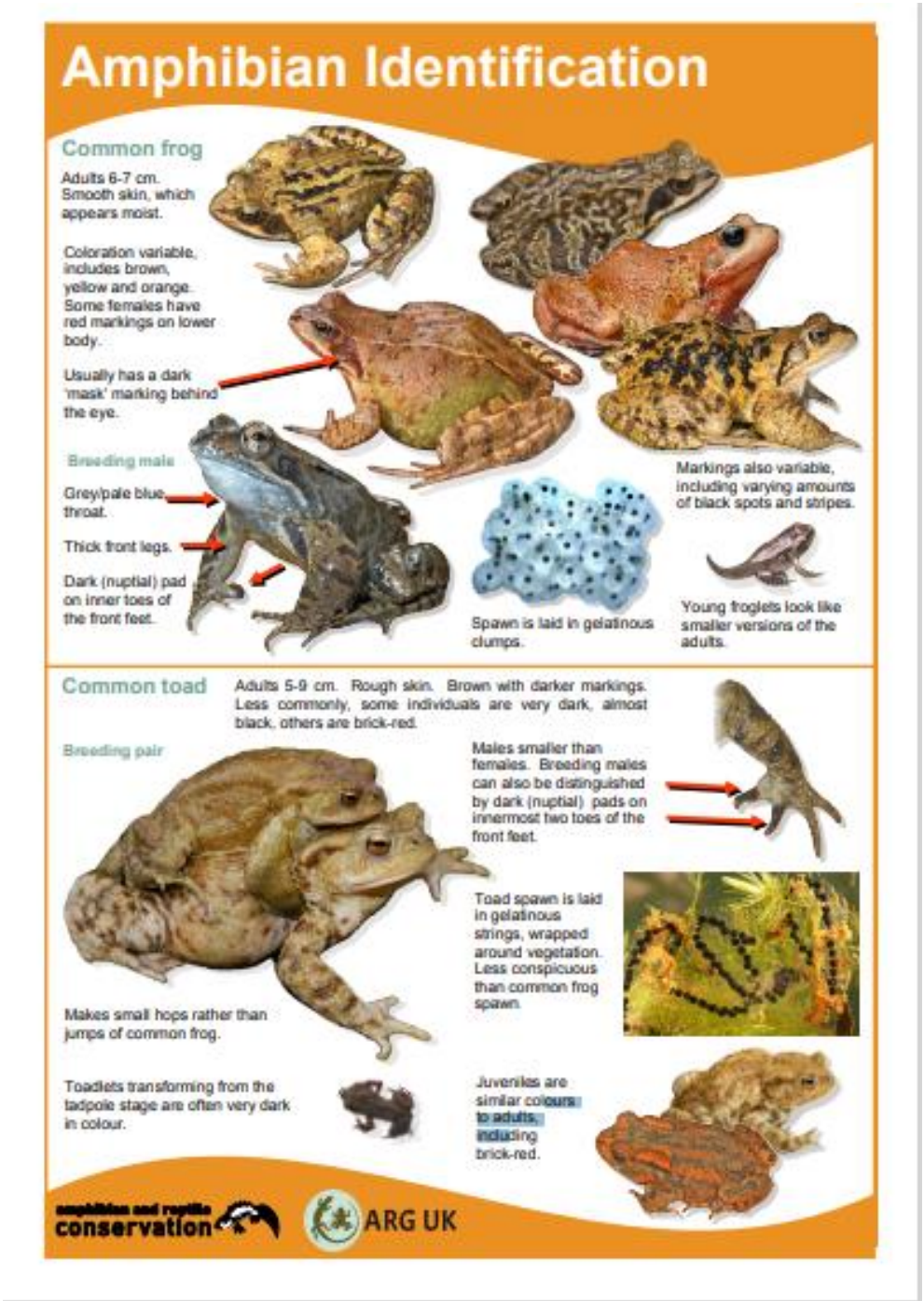
Lochan

The Lochan continues to have a healthy population of Roach, Perch and Rainbow trout. The fish in turn attract Cormorants to visit occasionally for a free meal.

Blue tailed Damselfly

We have been monitoring and protecting Common Toads (Bufo bufo) since we became aware of the obstacles preventing them reach the lochan to spawn. We now cover all the drains on the route preventing the toads falling in and having to be rescued, we have seen high numbers perish if not recovered quickly. As the migration takes place during the night, individuals who have not been successful in reaching the lochan are collected and released in the lochan , at the peak movement time large numbers can be collected . Our data is shared with "Lothian Amphibian Group" we also post our information on "Lothian Toad Watch" facebook and twitter pages. We have managed to collect some data since 2014 that seems to indicate that numbers are increasing hopefully due to our efforts, However 2020 was disappointing due to the large loss of Toads due to the roads being heavy salted, see our review and recommendations further on in the report.

Being aware of the needs of Common Frog (Rana temporaria) it was decided to create a small pond free of fish, this was dug in 1999. We were rewarded by frog spawn being seen in March.



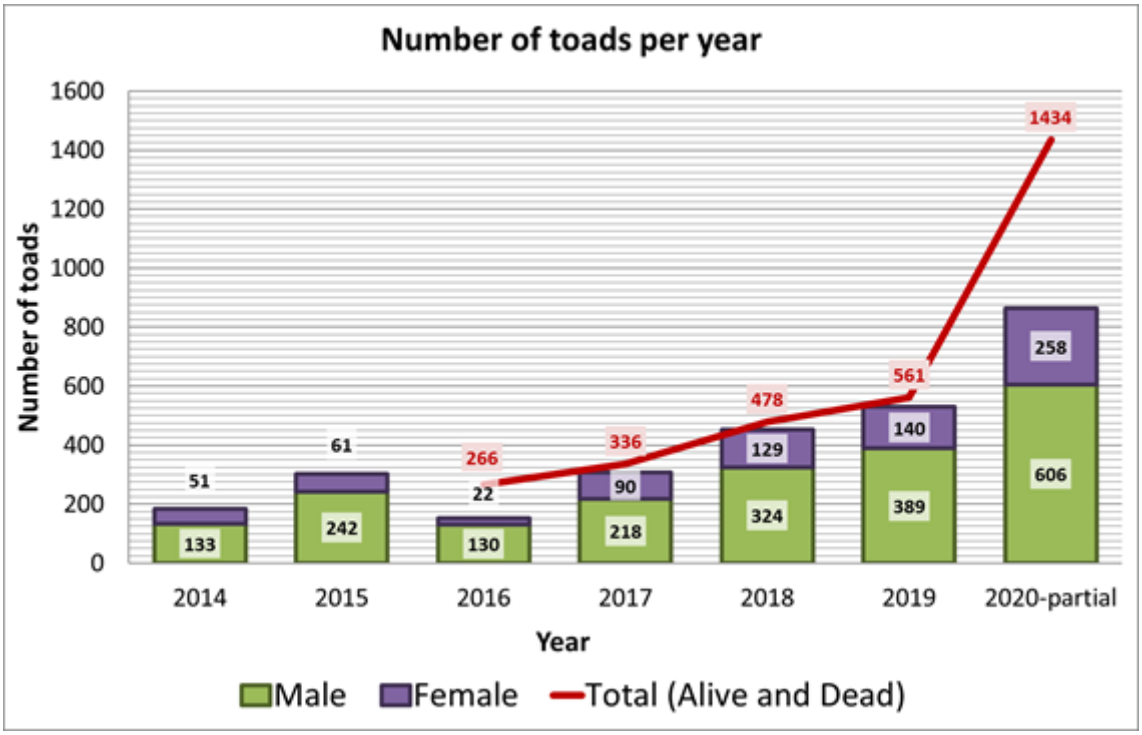
Our new pond proved productive with Common Frog spawning in it early in the year, tadpoles were still present in October probably due to the lack of food (despite our efforts to feed them) this is not unusual and in some cases tadpoles may over winter until the following year.

Frog spawn 17 March 2020

Common Toad (Bufo bufo) monitoring 2020

17 March

Having learned from the early years that drains were a major obstacle and death trap we decided to cover all drains on the migration route. We also put up notices to inform employees of toads crossing the road. We have been very successful in helping the toads to reach the lochan to spawn as numbers have steadily increased over the years. (see graph)



Monitoring started early on 20 February (same date as 2019) all drains were covered on the main migration route. The first large movement started on 17 March, with everything in place we thought it would be as previous years just a matter of collection any toads left on the road at first light and another couple of rounds during the day to pick up any still moving. All seemed normal except for a higher than normal killed by vehicles despite notices being put up this was very disappointing, however we were totally shocked by the numbers lost to excessive salt being put on the road, due to several consecutive nights of salt application, with no rain to wash it away (dry spring). The company hires a company to salt the road when the temperature drops, for obvious Health and Safety reasons. Despite our best efforts to save as many as possible (putting them in buckets of water, brushing the road) and extra visits by Mike Westoby .

A meeting is to be arranged with the gritting contractor, to discuss the high mortality rate this year, to discuss their practice, type salt used, etc. As what happened this year was certainly different to previous years.

2020 Alive – 864, Dead – 570

2019 Alive – 529, Dead – 32

TOADS 2020

Date	male	Female	Pairs	Dead
20 Feb	5			
7 March	3		10	
10	14		2	2
11			1	
14	16		6	
17	103		21	25
18	70		30	14
19	5		1	6
24	106	27	69	178
25	23	8	28	215
26	35	3	10	69
27	16	9	16	10
28	7		3	2
30		3		4
31		1	2	21
2 April	1	5	3	22
3				2

The salt we use.

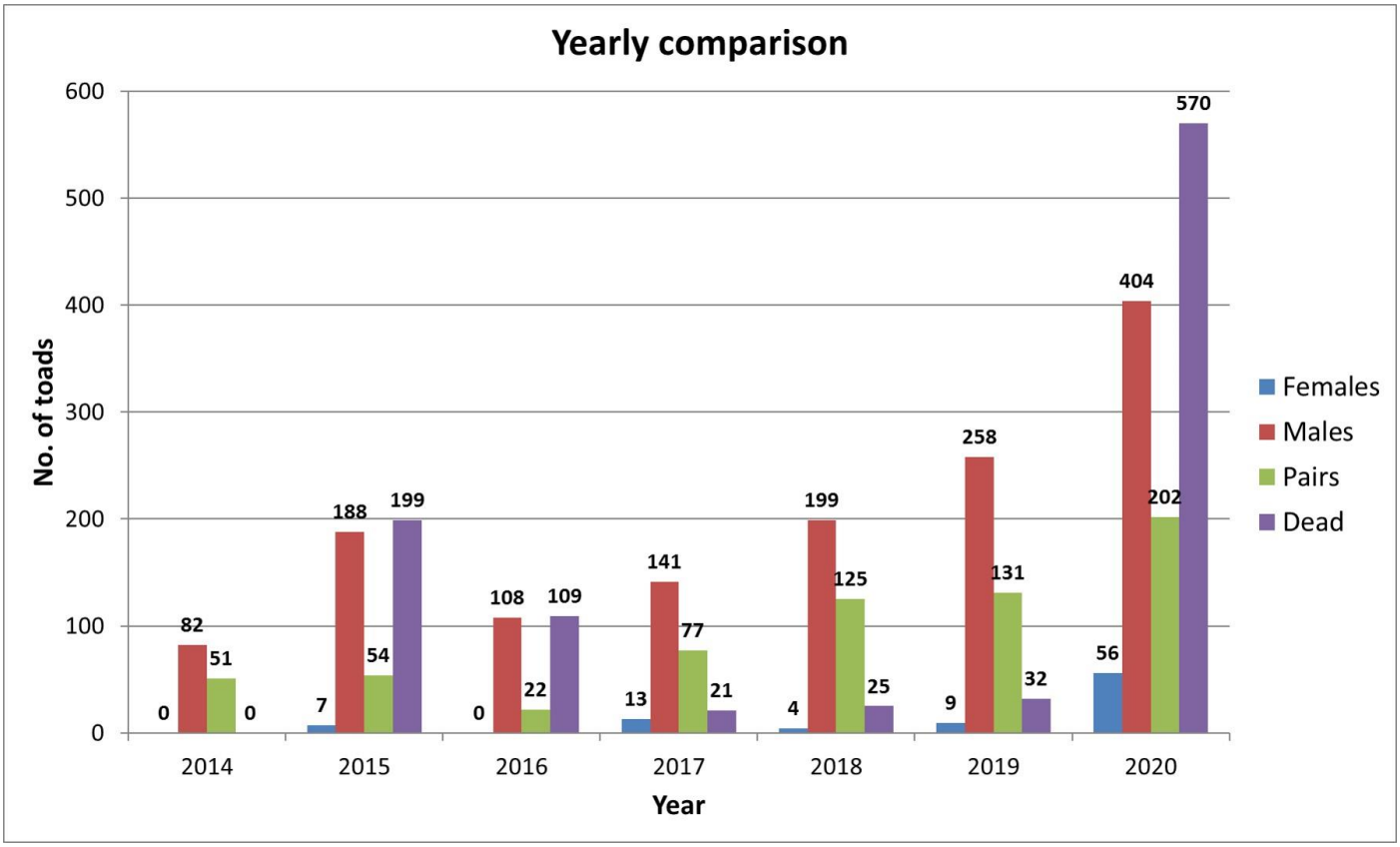
Large collection of salt collected along the kerb during spreading.

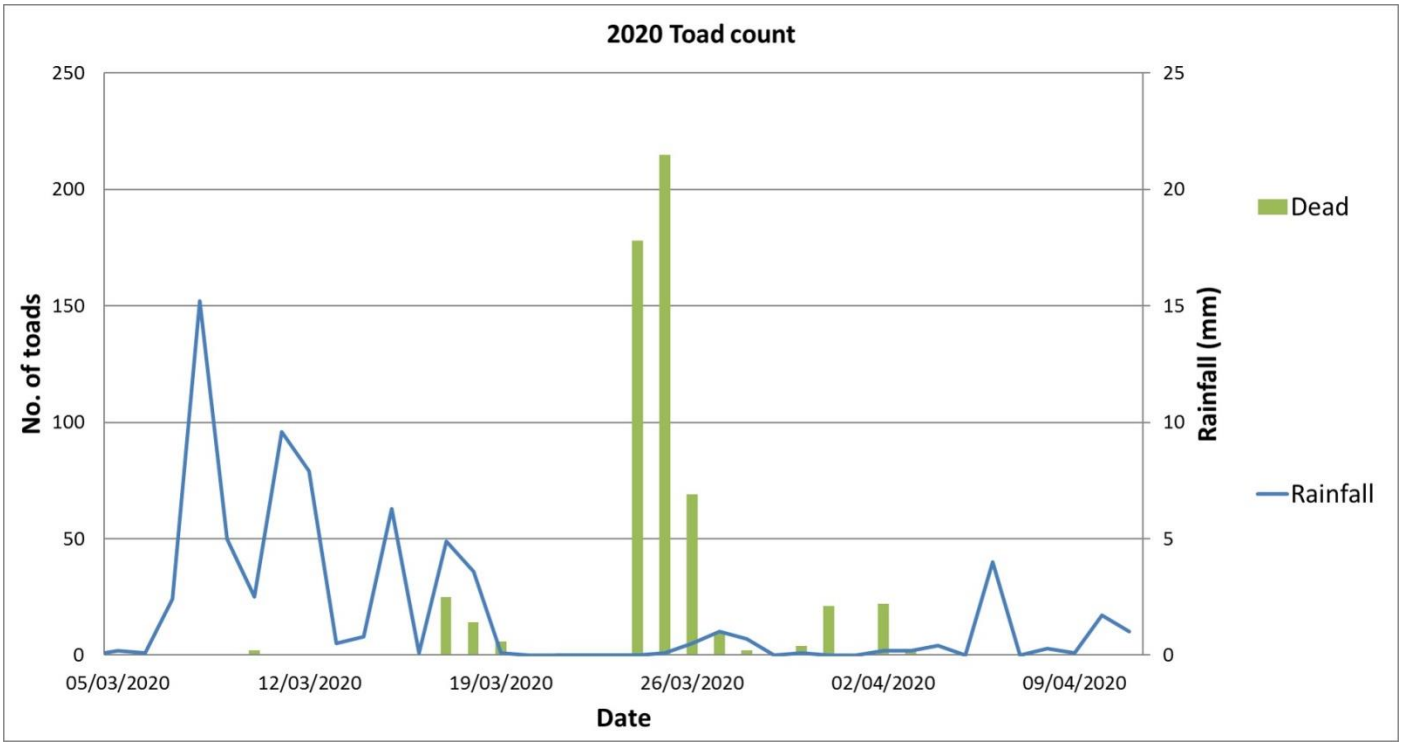
Toads trapped along the kerbs succumbed quickly to the very high concentration of salt.

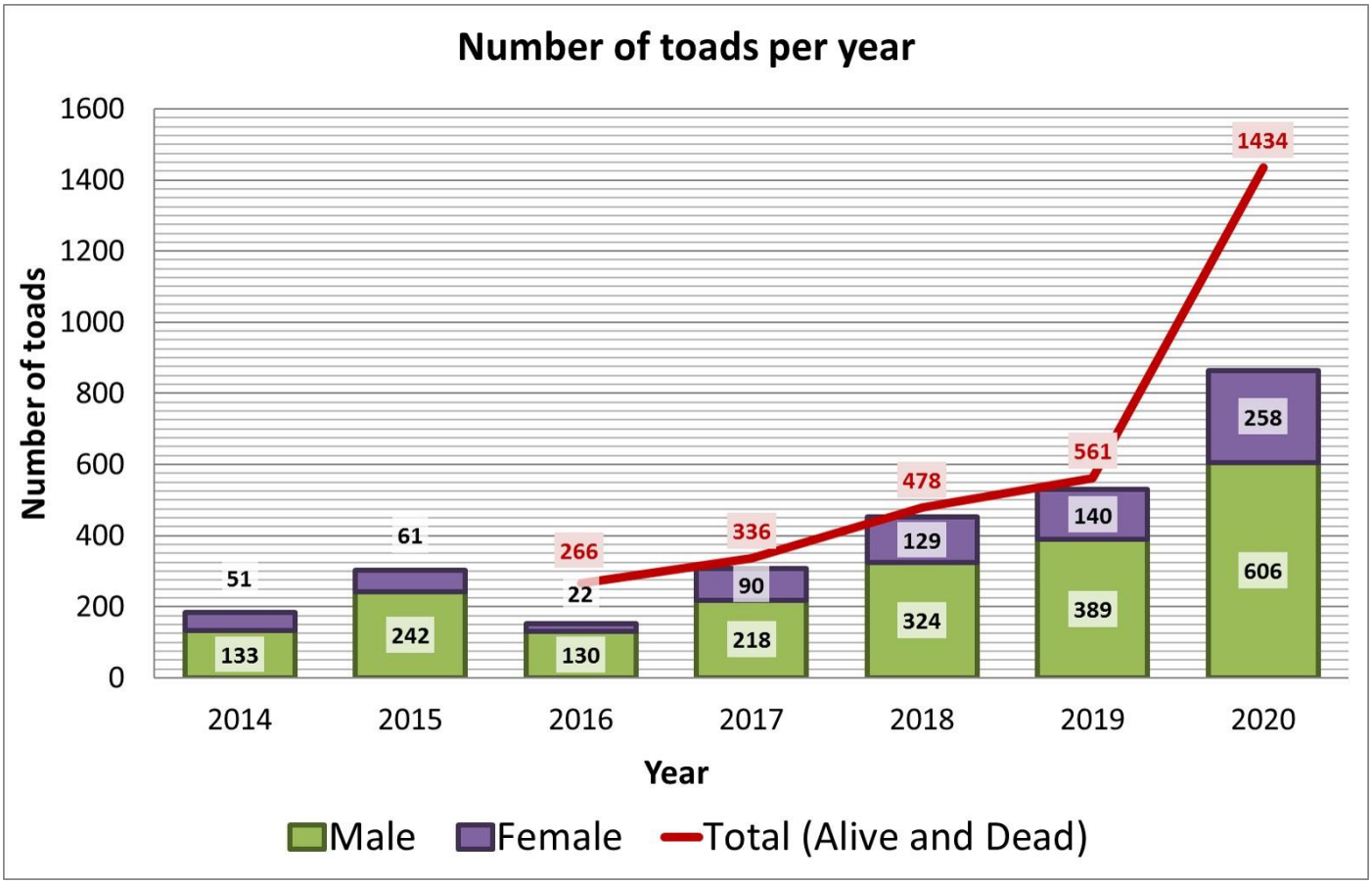
Salt dries out the skin of the toad by absorbing the moisture, leading to desiccation and death. Toads were found dead a few feet onto the road suggesting rapid deaths. Females were found dead with males alive on their backs as they crossed the road.

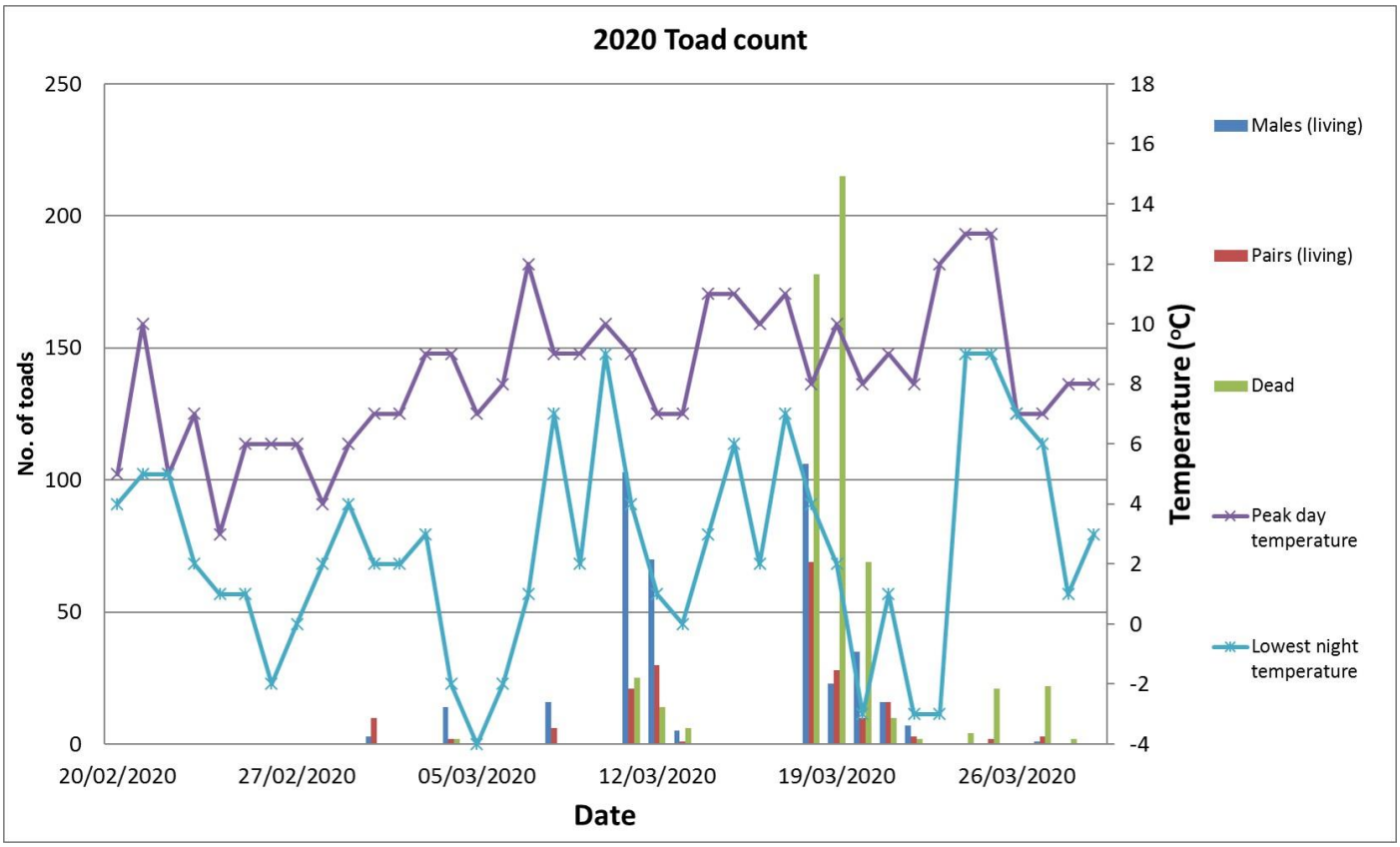
This picture shows how the moisture has been drawn from the toads body by the salt.

Large salt granules can be seen on the road surface.


Yearly comparison
600
500
400
300
200
100
0
No. of toads
0
82
51
0
7
188
54
199
0
108
22
109
13
141
77
21
4
199
125
25
9
258
131
32
56
404
202
570
2014
2015
2016
2017
2018
2019
2020
Year
Females
Males
Pairs
Dead


2020 Toad count
250
200
150
100
50
0
No. of toads
25
20
15
10
5
0
Rainfall (mm)
05/03/2020
12/03/2020
19/03/2020
26/03/2020
02/04/2020
09/04/2020
Date
Dead
Rainfall


Number of toads per year
Number of toads
1600
1400
1200
1000
800
600
400
200
0
51
133
61
242
266
22
130
336
90
218
478
129
324
561
140
389
1434
258
606
2014
2015
2016
2017
2018
2019
2020
Year
Male
Female
Total (Alive and Dead)


2020 Toad count
No. of toads
250
200
150
100
50
0
18
16
14
12
10
8
6
4
2
0
-2
-4
Temperature (°C)
20/02/2020
27/02/2020
05/03/2020
12/03/2020
19/03/2020
26/03/2020
Date
Males (living)
Pairs (living)
Dead
Peak day temperature
Lowest night temperature

BIRDS

A big part of our survey work is the British Trust for Ornithology's "Nest Recording Scheme" our nest boxes are used in participation of this project. We have been very successful since we began recording in 2014 with most of our boxes used. Tree Sparrows have been the biggest beneficiary of our boxes with pairs being able to raise 3 broods of chicks most years.

We decided to introducing 5 new boxes to the site targeted at specific species - Barn Owl, Kestrel, Great spotted Woodpecker and Nuthatch. The boxes were made by Mike Westoby and were put up in February.

Barn Owl Box

Nuthatch Box

Kestrel Box

Great spotted Woodpecker Box

Due to Covid 19 restrictions Nest Recording was suspended but we still managed to get some details from our boxes, again most of our boxes were used even the new ones. The Woodpecker box was used by Tree Sparrows and the Nuthatch by either Great or Blue Tits.

BOX No	2014	2015	2016	2017	2018	2019	2020
1	TS 3	TS 2			TS 2	TS 2	TS
2	TS failed		TS failed	TS 1			
3	TS 3	TS 1	TS 1	BT		TS 4	TS
4							
5	SD 2	SD Failed	SD failed	SD 2	JD SD	JD	JD
6		R failed				BT	BT
7			SD				
8	BT	BT	BT	BT	BT	BT	BT
9	GT	GT	GT	GT	GT	TS 2	GT
10		BT		BT	BT		BT
11		SD 1	SD	SD failed	JD SD	JD	SD
12				BT	BT	BT	BT
13	BT	BT		BT	BT	BT	BT
14	TS 2	TS 1	TS failed	BT	GT		TS
15	TS 1	TS 1	TS failed		TS BT	TS 3	TS
16		TS 1	TS failed	TS 2		TS 3	TS
17		TS failed	TS failed	TS 2		TS 3	TS
18					TS 1	TS 3	TS
19		TS 2	TS 1		TS 1	TS 3	TS
20		TS failed				TS 3	
21		BT	BT	BT	BT	BT	TIT
22					TS 1	TS 1	TS
23		BT		GT	BT	GT	TS
24		TS 1	TS 1		TS 1	TS 1	TS
25			BT		TS 1	TS 3	TS
26		TS failed	BT	TS 2	TS 1	TS 3	TS
27							
28							
29							TIT
30							TIT
NH 1							TIT
NH 2							TIT
WP							TS
B OWL							

TS – Tree Sparrow . J – Jackdaw . BT – Blue Tit . GT – Great Tit .TIT- Tit species . SD – Stock Dove.

Other breeding birds recorded were Wood Pigeon, Pied Wagtail, Blackbird, Robin Moorhen, Lesser Black backed Gull and Oystercatcher.

Hooded Crow
28/08/20
Only a few Hoodies are seen in Lothian in any year.

Tawny Owl
8/07/20

Pied Wagtail juvenile

Jackdaw juvenile from one of our boxes

MAMMALS

Our most recorded mammal is the Rabbit with most activity noted at late evening and at night.

Badgers

Brown Hare

Fox regular visitor.

Several local cats visit the site, one even managed to get into the main office area.

Cinnabar moth (Tyria jacobaeae) larvae

Lots were seen feeding on ragwort on the south bank however no adult moths were seen.

Cinnabar moths start life as yellow and black caterpillars and are particularly fond of munching on ragwort plants. Their bright colours warn predators that they're poisonous, but they only build up their poison after feeding on the ragwort. The caterpillars spend the winter as cocoons on the ground before emerging as moths in the summer. Cinnabar moths can be seen flying during the day and night and are often mistaken for butterflies.

Butterflies

Painted lady

The Painted Lady is a long-distance migrant, which causes the most spectacular butterfly migrations observed in Britain and Ireland.

Each year, it spreads northwards from the desert fringes of North Africa, the Middle East, and central Asia, recolonising mainland Europe and reaching Britain and Ireland. In some years it is an abundant butterfly, frequenting gardens and other flowery places in late summer.

Other Butterflies seen were Peacock, Meadow Brown, Ringlet, Green veined White and Large White.

Ringlet

Our 2 small bug houses have been used by solitary bees after being relocated to the south bank area. They have been used by Red Mason and leaf cutter bees.

We have an opportunity to make some more bee houses for these important pollinators.

When most people think about bees, they think about sociable honeybees or large furry bumblebees.

However, in the UK alone there are **267 species of bees** and over 90% are not social and do not live in colonies. These are called solitary bees.

What's so special about solitary bees?

- Solitary bees vary considerably in size, appearance and where they choose to nest. Roughly 70% are called mining bees and nest in underground burrows. Bees that nest in houses are called cavity nesting bees.
- Do not live in colonies, produce honey or have a queen.
- Do not produce wax to construct the cells inside the nest instead different species use different materials to construct their cells and nests.
- Drink nectar directly from the flower and spend most of their time collecting pollen which is mixed with a small amount of nectar as food for their young.
- Are fantastic pollinators: a single red mason bee is equivalent to 120 worker honeybees in the pollination it provides.
- Do not have pollen baskets for carrying pollen, meaning that each time they visit a flower they lose far more pollen than social bees, which makes them much better pollinators.
- Provide each larvae with everything it needs but they do not tend to the young as they grow and never get to see their offspring emerge.
- Are non-aggressive and do not swarm.
- Safe around children and pets.

Their place in the ecosystem

Solitary bees are easily overlooked but they are known to pollinate plants more efficiently than honeybees.

They provide an essential pollination service, pollinating our crops and ensuring that plant communities are healthy and productive. Without them mammals and birds would not have the seeds, berries or plants on which they depend: in fact, approximately one in three mouthfuls of food and drink require pollination.

Wild flowers provide essential resources of pollen and nectar for these busy workers – and ample nesting opportunities in their dry, hollow stems. Some such as the harebell carpenter bee are so dependent on a particular wild flower plant (in this case bell flowers) they cannot survive without it.

Red mason bee, Osmia bicornis (Osmia rufa) – red/gingery hair, females have small horns on their heads = use mud to cap tubes (March–July)

Leaf cutter bee, Megachile willughbiella – broad head, large mandibles for cutting leaves and an upturned abdomen = use leaves (May–September)

What happens in the bee house?

Each female bee lays 20 to 30 eggs during her life.

When a bee finds a nest she will collect materials to create the cell for her first egg: a ball of pollen stuck together with nectar for each larvae to eat until it develops into an adult bee.

She places the ball inside the cell and lays an egg on top, leaving space for the larvae to grow into an adult bee. She builds a partition wall and repeats the process until the whole tube is filled, leaving a space at the entrance of the tube empty before closing it off and moving on to another tube.

Females choose whether to lay male or female eggs: since males emerge a couple of weeks before the females she lays all the females at the back and males at the front.

Solitary bees spend their early months hidden in the nest growing. They then spend the winter as a cocoon (or pupa) before emerging the following spring or early summer as adults. Once the adult bees have mated, the female looks for a suitable nest and the cycle repeats itself.

Acknowledgements

Thanks to the management team at South Queensferry for their support of our biodiversity projects.
Thanks to

Stevie Sellick for help with the nest box survey.

Hannah Persson for her help rescuing Toads and graphs.

MBT landscaping for their help managing the wild areas and creating more logpiles.

Mike Westoby for Lochan management, amphibian monitoring, nest boxes and habitat creation.

Thanks to everyone who took the time to pass on their observations.

Jim Easton