Lesser horseshoe bat mitigation on a major road scheme in South Wales

A465 Heads of the Valleys
Section 2: Gilwern - Brynmawr

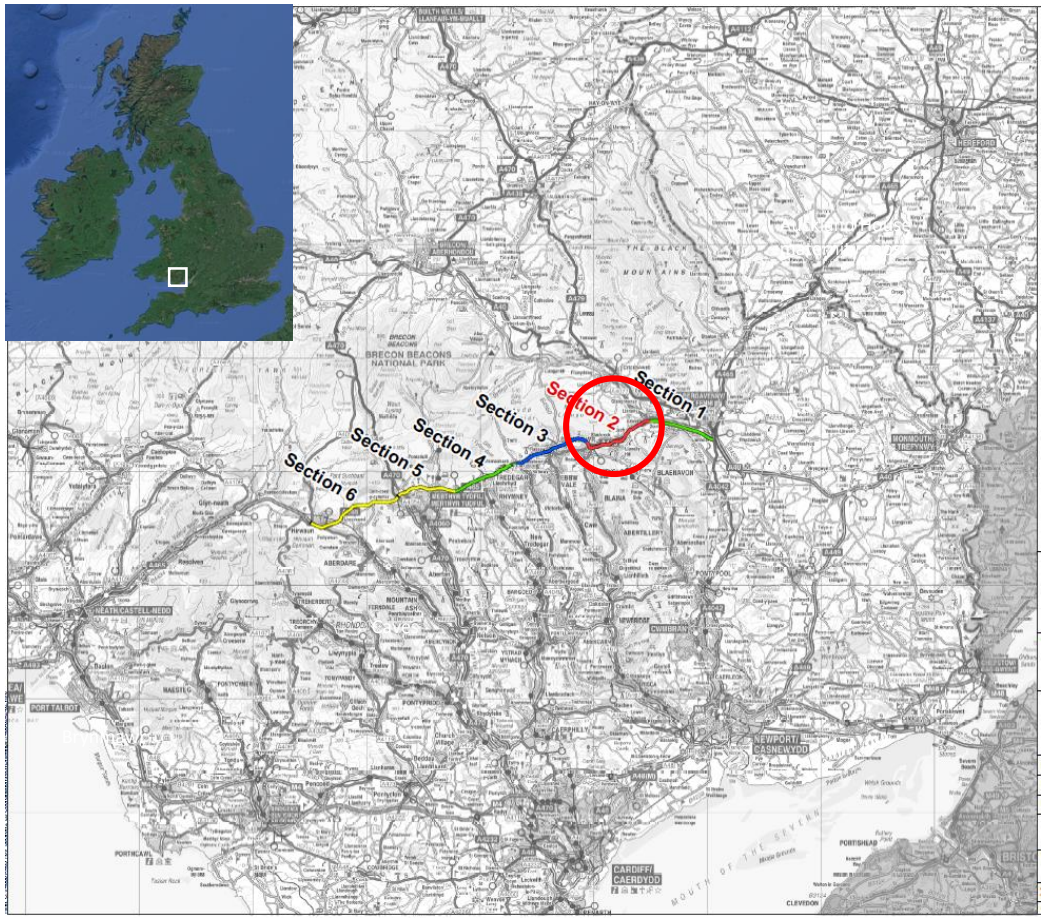
COSTAIN

RPS

Llywodraeth Cymru
Welsh Government

RICHARD GREEN ecology

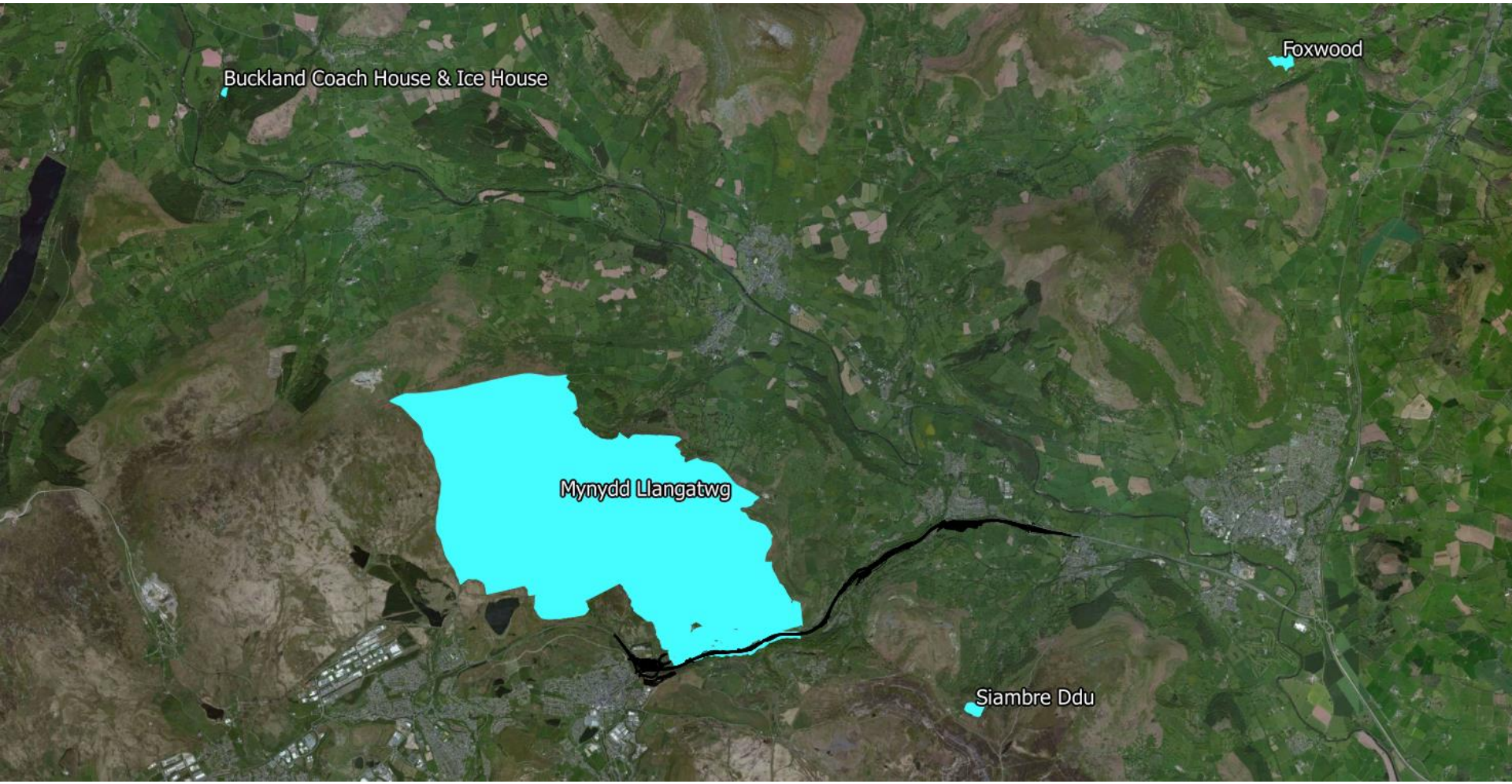
Introduction



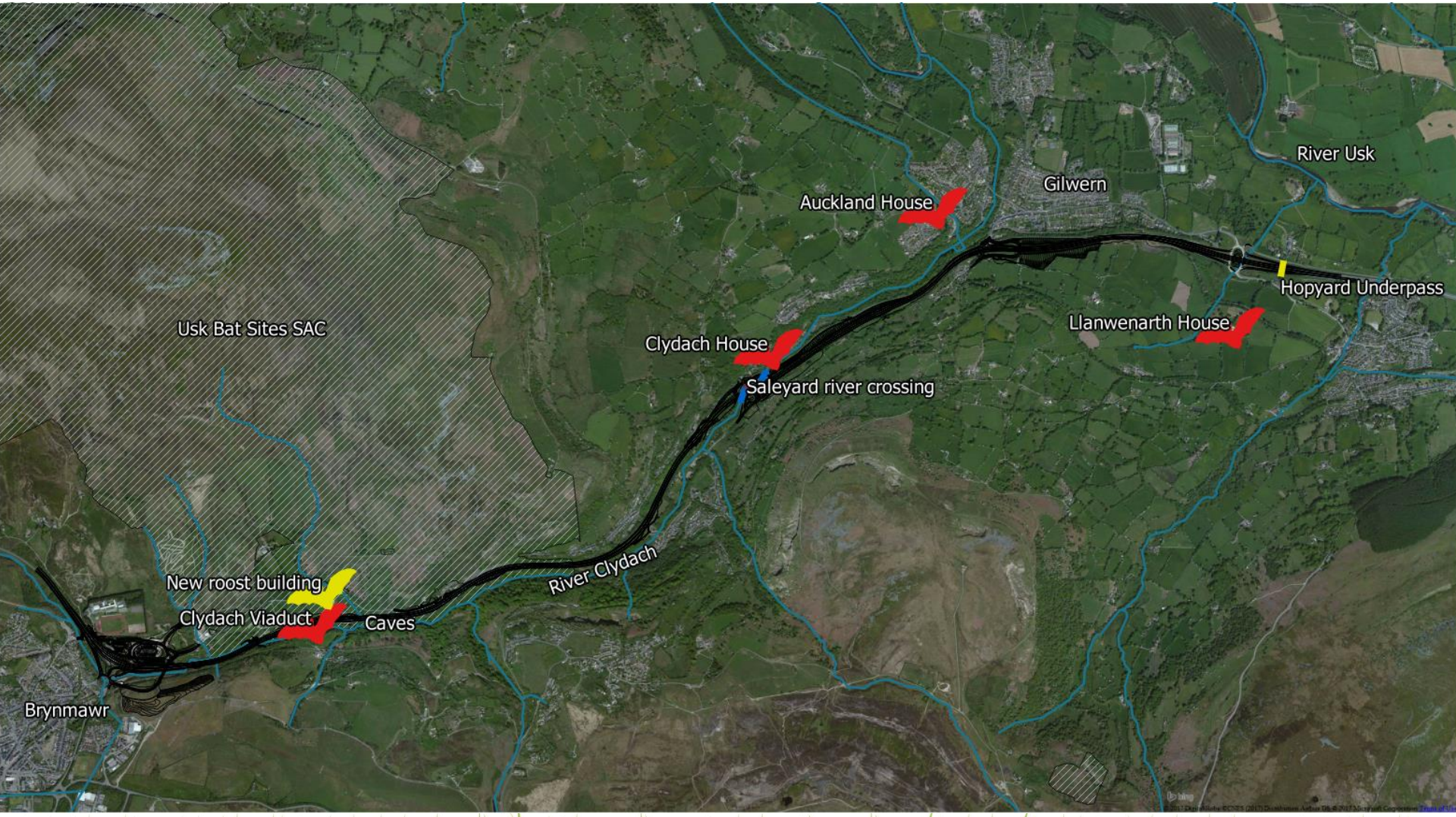
A465 Heads of Valleys Road (Section 2)

- Built in 1960s
- Baseline bat survey (1995-2014)
- Dualling improvement work January 2015 – 2019
- Impacts & mitigation
  - roost loss & disturbance
  - loss of foraging habitat
  - severance
- Bat monitoring during construction and up to 10 years after opening
- Results so far (3 years into construction)

Usk Bat Sites SAC



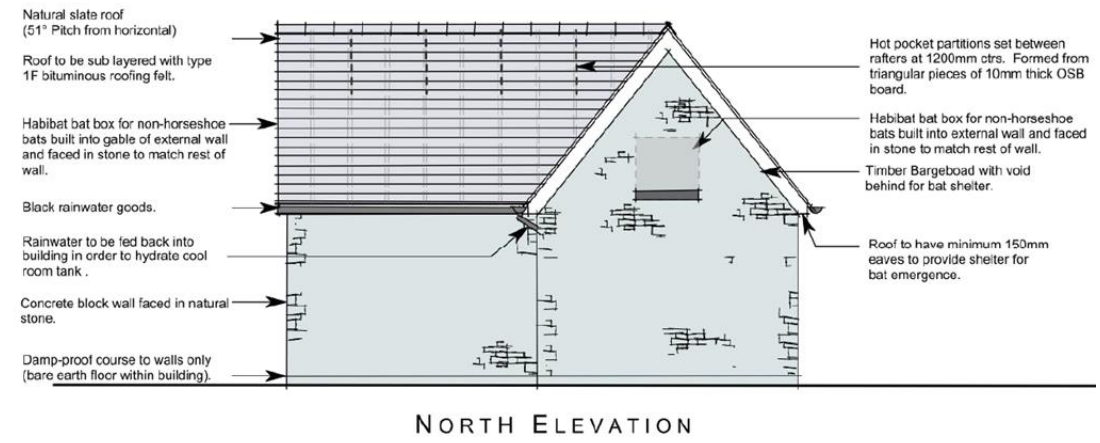
Lesser horseshoe bat features



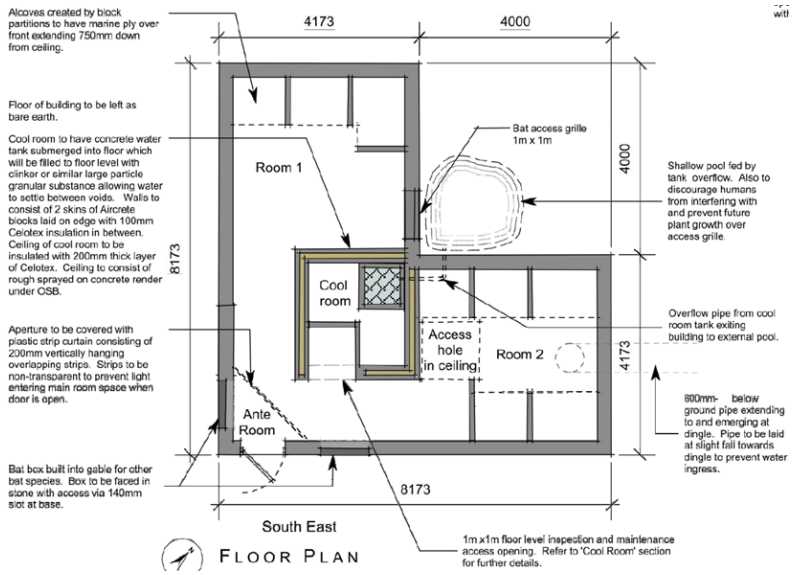
Roosts – New Bat House

Impacts - Loss of 4 day and night roosts and 1 low-use hibernation site in an old mine adit

Mitigation - Provision of 5 new underground roosts, bat house, 4 ‘stepping-stone’ roosts along Section 3 (compensatory measures) and improvements to Clydach House maternity roost



NORTH ELEVATION



FLOOR PLAN

RICHARD GREEN ecology

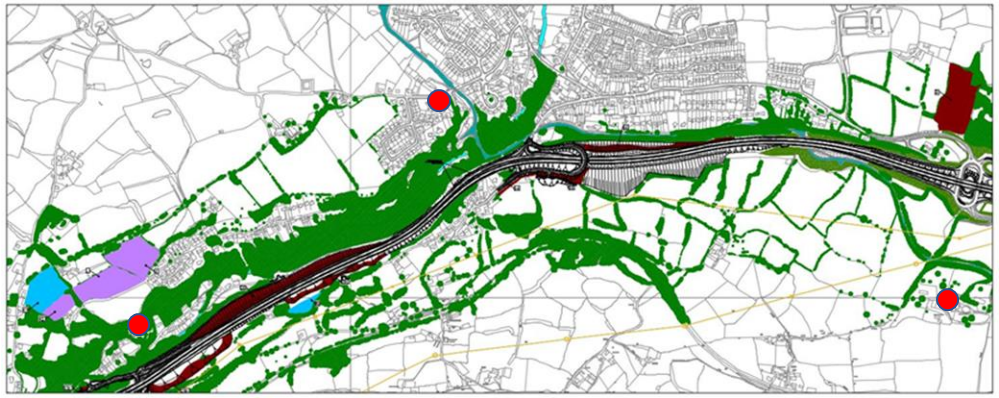
Closure of Coal Tar Adit – minor hibernation roost

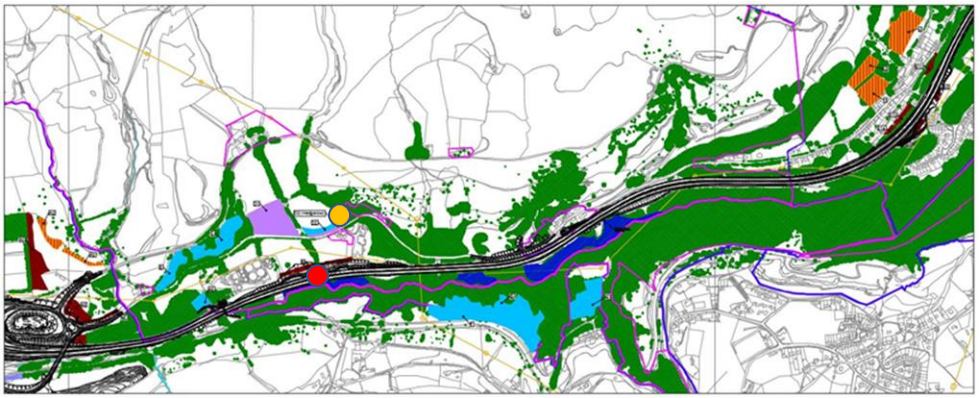
- Monitored using static bat detector
- Vegetation clearance, floodlighting and partial obscuring of entrance did not deter bats
- Sawdust food smoker lit 1 hour after sunset to allow bats to exit – burned for 16 hours, beyond dawn
- No bats recorded after second night of using smoker, so adit closed
- Continued to monitor bat activity inside adit for 3 nights to check if any trapped inside

Woodland foraging habitat

Impacts – Approx. 21 ha of woodland cleared - 18.42 ha within 1 km of maternity roosts and 1.2 km of hibernation roosts

Mitigation - Planting of approx. 23 ha deciduous woodland. Replacement ratio at least 1:1 within SAC and roost zones





BMA M – over 2 years growth, 2014/15 season

Disturbance

Impacts - Disturbance of bats in Clydach Viaduct maternity roost and caves under the road

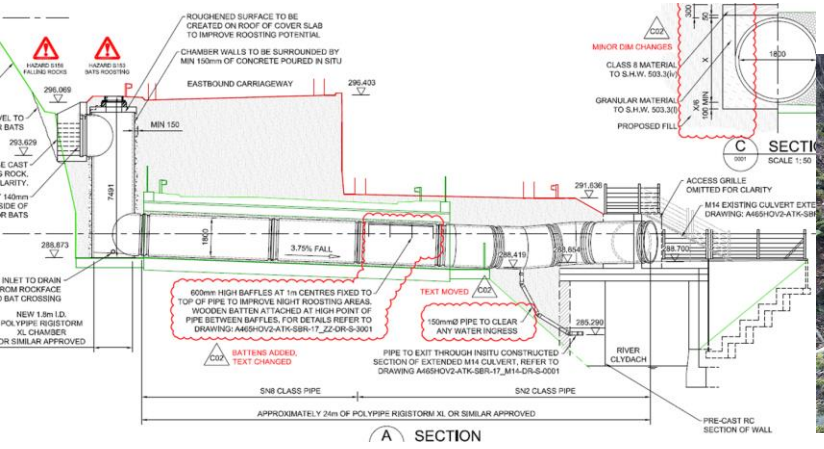
Mitigation - Timing and sensitive working practices – Karst Protocol/method statement

- 4 small caves/overhangs in cliff to be excavated
- Rope access work
- Road closure needed to work at caves because of rockfall risk
- Not feasible to use ‘smoker’
- Entrances boarded over in May 2016 with 30 mm high opening at the bottom to allow bats to crawl out and discourage return
- Ecological watching brief during excavation – no bats seen

Disruption of flight-lines/bat crossings under road

Impacts – Vegetation clearance; potential loss of under-road crossings

Mitigation - Retention and extension of under-road crossings, including temporary measures during construction



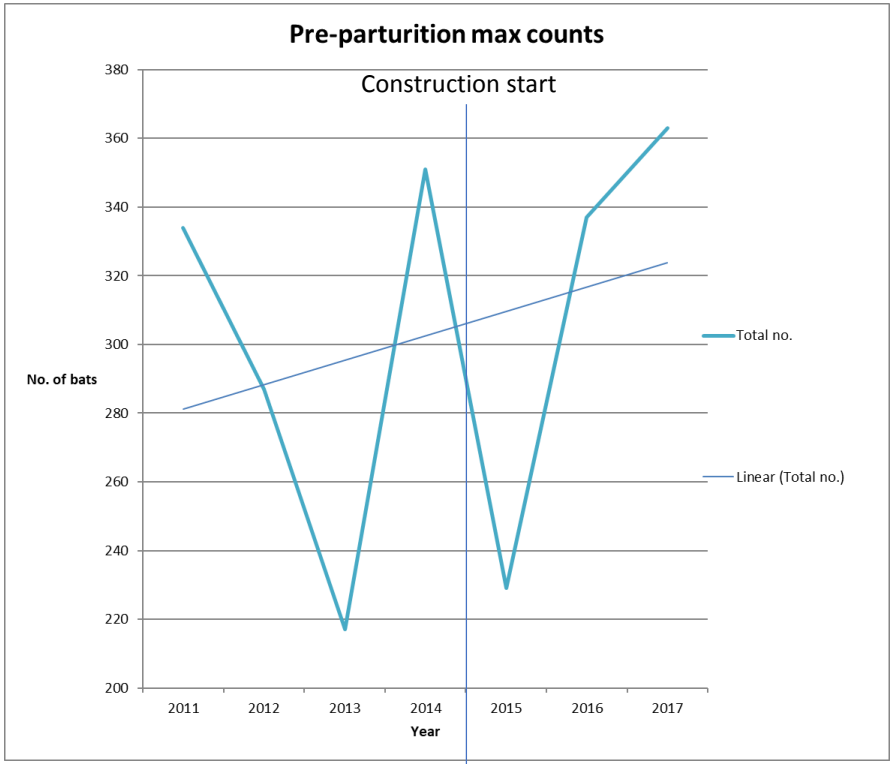
- 17 crossings. Those used by LHS bats ranged from 1m diameter to 5m x 5m opening and up to 127m long
- Use varied from no bats to a Bat Activity Index (BAI – bat passes/hours x 100) of over 2000 at Saleyard river crossing
- All extensions are the same diameter or larger than existing
- Vegetation retained at culvert entrances or temporary flight lines provided until replacement planting matures
- Provision of additional culvert in section lacking existing culverts

Monitoring

- Monitoring undertaken annually during construction, for five years after ‘opening’ and years 7 & 10, i.e., 2015 - 2029
- New roosts monitored by internal inspection four times annually (spring, summer, autumn, winter)
- Continue pre-parturition and juvenile counts at maternity roosts
- Continue hibernation counts of caves
- Monitoring schedule includes a sample of 5 under-road crossings formally monitored (out of 11 affected), manually and using static detectors, plus additional ad hoc monitoring of others
- Monitoring at Hopyard Underpass (Section 1) 2014 - 2017

Pre-parturition counts

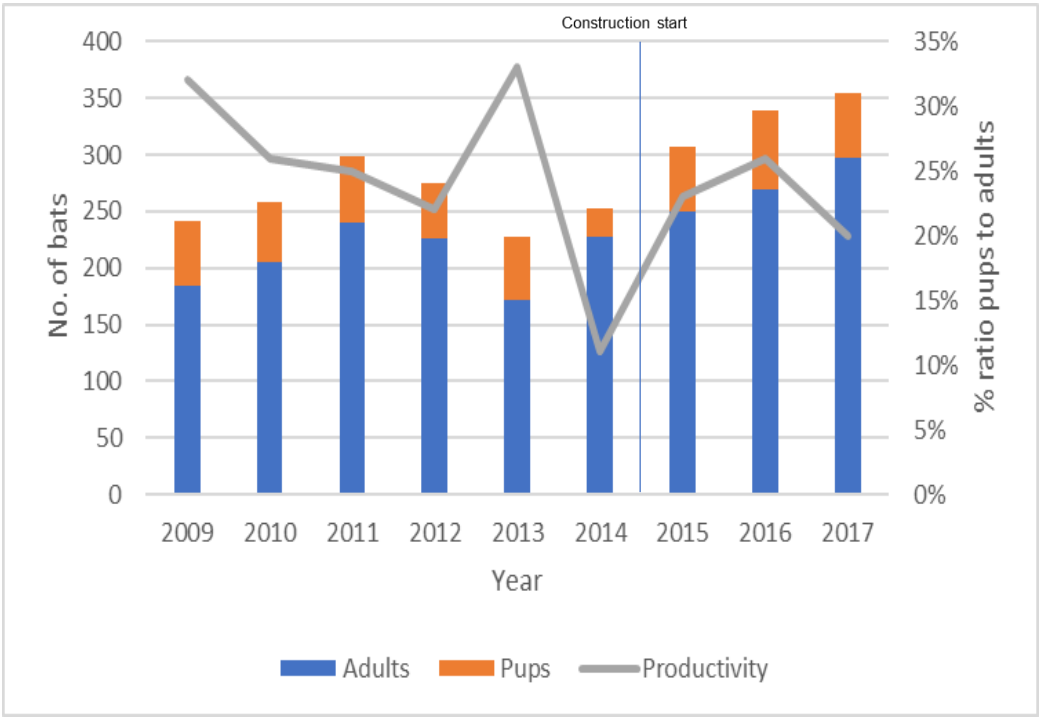
- 2 counts late May/early June (NBMP method)
- Initial dip in 2015 but then increased. May 2015 was cold and births a week later than normal. July adult counts compared favourably to previous years.
- Summer 2012 was the wettest for 100 years and may have affected numbers in 2013
- 5-year trend is positive
- Increase in numbers at Clydach House may be due to installation of hot-box and enlarged access



Pre-parturition max counts	2011	2012	2013	2014	2015	2016	2017
Auckland House	94	99	84	148	64	93	115
Clydach House	59	57	45	77	89	114	102
Clydach Viaduct	39	40	13	35	6	77	59
Llanwenarth House	142	91	75	91	70	53	87
Total no.	**334**	**287**	**217**	**351**	**229**	**337**	**363**

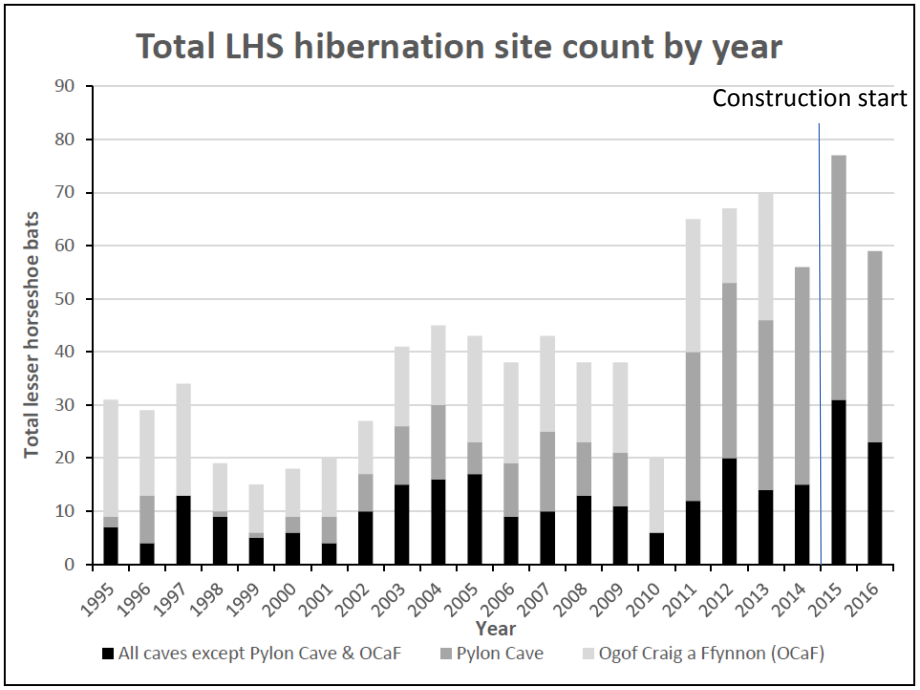
Juvenile counts and productivity

- July emergence, followed by internal inspection to count pups
- Highest total pup count in 2016
- Adjusting figures to account for Welsh national trend of 3.2% increase from 1999-2015 (BCT), there has been no significant change in pup numbers since construction began
- Productivity fluctuations are within the range one might expect and give no cause for concern
- Bat house completed October 2015 – evidence of bat use in July 2016 with a mother and pup present. 2-3 bats regularly present



Hibernation counts

- Undertaken in February each year
- Ogof Craig a Ffynnon surveys suspended from 2014 onwards due to instability at the entrance
- Some of the other individual sites not surveyed in some years due to access issues
- 2015 count highest ever. 2017 results not yet processed statistically but similar number to 2016 (57 bats)
- Accounting for a Welsh national trend of 5.8% increase per year from 1999-2015 (BCT) and adjusting figures to account for unsurveyed sites, the increase in 2015 is statistically significant, whilst the 2016 population is not statistically different to the four years prior to construction.



NB Pylon Cave was monitored in all years except 2010. Visits to Ogof Craig a Ffynnon were suspended from 2014 onwards, due to instability at the entrance.

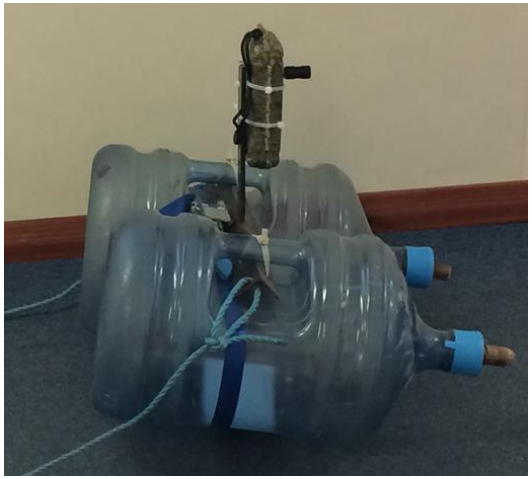
Under-road crossings

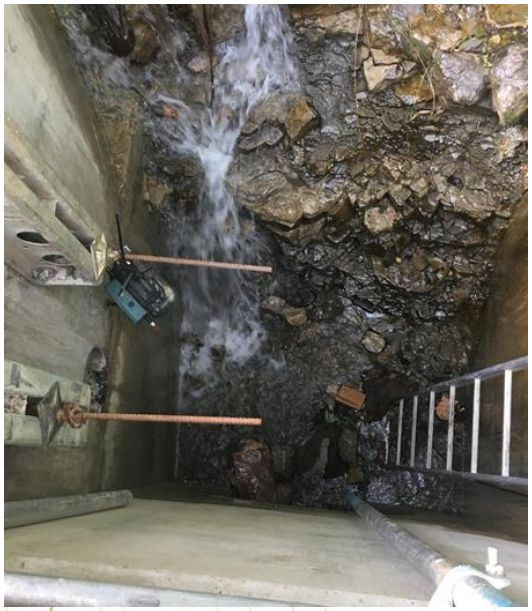
Saleyard river crossing

- Main crossing location - extensive baseline data
- Continued use and bat activity index in 2016 was higher than in any of the previous baseline years, even factoring in a 3.2% increase in population from 1999-2015 (BCT)

Other river crossings and culverts

- Use of raft to mount detectors in culverts. Full spectrum vs zero crossing detectors where constant background water noise
- Bats recorded flying through 5/5 crossings monitored so far during construction (plus others). Max. baseline Bat Activity Index exceeded at least once at 3/5 crossings in 2016. 2017 data still to be analysed
- Insufficient baseline data to make statistical comparison, i.e., some crossings only monitored for one night during baseline data collection, but shows that road is permeable to bats





Hopyard underpass (Section 1)

- Bat underpass at west end of Section 1 - constructed 2006; road opened 2008; monitoring until 2013. Monitoring concluded that bats were passing through the underpass without hindrance from the grilles.
- Section 2 works may have altered vegetation over northern portal so monitoring continued for baseline.
- Bats seen flying over the road in 2015 so monitoring adjusted to include seven static detectors, spaced 5m apart over road, along with observers at each portal for one whole night in May, July and September.
- Early 2016 - Trees at entrance reduced in height; additional planting to fill gaps in understorey; vegetation cut back from road edge and screens erected above entrances. 19-33% of bats flying over the road; 67-81% flying through underpass
- Early 2017 – Grilles at each entrance replaced with security fencing providing a larger gap for bats to fly through. 2-7% of bats flying over the road; 93-98% flying through underpass

Criteria for Success – the story so far

AIES (Assessment of Impacts on European Sites)

Based on the Usk Bat Sites SAC Conservation Objectives and Performance Indicators, the mitigation measures would be considered successful if the monitoring programme demonstrates the following:

- Bats cross the Proposed Scheme utilising the under-road crossing structures in similar numbers to those recorded as part of the baseline/pre-construction monitoring. ✓
- Numbers of Lesser Horseshoe Bats recorded at maternity roosts show no significant decline over a five-year period, also considering the regional or national trend (Welsh) in Lesser Horseshoe roost numbers over this period. ✓
- A total of 18 or more Lesser Horseshoe Bats are recorded at the Clydach Gorge cave sites, and 47 to be recorded at least once during the six year monitoring cycle. ✓

Acknowledgements

Any questions?

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