

## Tayside Beaver Health Screening Proposal

### Aim

To determine health status and screen for a range of native and non-native disease and parasites, for any trapped beaver recovered within the Tayside catchment.

### Background

It is now accepted that a sizeable, free-living beaver population is established within the Tayside catchment. A recent survey estimates this population may number ~140 individuals. This population is presumed to consist of escaped and/or deliberately released individuals from captive collections originating from Bavaria and possibly Poland. It is also presumed that the Tayside population consists mainly of second generation animals but there is also a good probability that imported, wild individuals may also be present. These animals are presumed to have completed their statutory 6 month rabies quarantine period, however captive collections vary in enclosure design and husbandry, so it is likely that many of the beaver collections have not completed more thorough health screening (this is currently not a legal requirement) and that their animals have been mixing with local wildlife for a number of years. As this beaver population is free-living, individual beavers are likely to carry and have been exposed to a range of native diseases and parasites already present in other Scottish wildlife, some of which may be transferable to humans and other animals. Revealing these may be of interest, especially to give a full picture of the health status of this population, but without careful explanation and comparison with prevalence levels in other native wildlife, such results may be used out of context.

Resource and practical limitations suggest that it is very unlikely the entire population can be health screened, therefore it is suggested an agreed sample size for screening is determined. This sample size should be realistic to trap given resources available and should be statistically robust. It has been agreed by the Tayside Beaver Study Group that any trapped beavers should be health screened as according to those protocols applied at the Scottish Beaver Trial. This group has also decided that any screened beavers are to be released at point of capture, with the majority of veterinary results being received a few weeks after release. This trapping and release process would require the appropriate licensing from SNH.

The presence or absence of non-native parasites and diseases that can be transferred to humans and other wildlife should be a primary concern. In relation to beavers within Britain those of potential concern may be Tularaemia, Echinococcus and Rabies. Blood and faecal samples will enable screening of all diseases and parasites that may be of concern, except for Echinococcus. Currently no diagnostic method exists for determining the presence of this parasite in intermediate hosts (such as beavers), but a number of screening methods may be used in conjunction to give the highest probability of an accurate diagnostic. Rabies cannot be tested for, only clinical symptoms observed.

### *Echinococcus multilocularis* as a special case

This is a zoonotic parasite which Britain is currently deemed free-from. Wild beavers directly imported from EM positive areas of Europe may act as intermediate hosts and spread the parasite if canids (red fox, domestic dogs) scavenge on infected carcasses. Intermediate hosts can not pass the

parasite to each other, it must go through the final host, which then transmits parasite eggs via faeces. Currently there is no single standard and accepted method to screen beavers for this parasite apart from post mortem examination. Even in humans a range of diagnostic tests must be undertaken. RZSS have developed diagnostic methods to screen for EM in living beavers, including ultrasound, laparoscopic investigation of liver and blood sampling for a serum test being developed by Bern University which is yet to be validated.

The risk of Tayside beavers carrying EM would be restricted to directly imported animals which had then subsequently escaped from captivity. These numbers may be low, and in turn the risk of the presence of EM may be low, but given the significance of EM presence the logical option during any trapping and health screening program would be to also screen for this parasite. Those animals most likely to potentially harbour EM would be older adults, hence any cysts are likely to be quite prominent and therefore easy to identify.

#### Field screening versus veterinary facility

For EM screening each beaver would need to be anaesthetised for ~15 minutes. This procedure has been undertaken before in field conditions so is possible, however, this occurred when several animals were trapped at the same time and they belonged to the same family group so could share the same recovery space. Trapping for beavers within the Tayside catchment is likely to involve single or very low number of animals being trapped infrequently. To keep a field veterinary team on standby for a number of weeks would be an expensive process and impractical. Another option is to have a central point where a veterinary team could be made available on short notice.

It is proposed that any trapped beaver be transported to the veterinary facility at Edinburgh Zoo for full health screening to take place. After anaesthetic recovery the animal would be transported to point of capture and released. Recovery times in similar procedures in beavers have taken as little as 10 mins. This also means more veterinary equipment is on hand so the full range of testing can be carried out, including X-ray if necessary.

#### Trapping and Transportation

Permission will be sought from various landowners where beavers have been identified as being present by SNH. Specifically designed beaver traps will be placed in suitable locations and monitored regularly. Any trapped beaver will be removed from the trap and transferred to beaver transport crates then transported to the veterinary facility at Edinburgh Zoo. Licence for trapping, handling and transportation will be sought from SNH and undertaken by experienced staff. After recovery from anaesthetic and determined fit for release. Every beaver will be transported back to point of capture and released.

#### Health Check and Sample Collection

Every trapped beaver will be placed under anaesthetic using revised techniques used in ~50 previous beaver clinical examinations/operations. Once anaesthetised blood, faecal and hair samples will be collected, a range of body measurements and weight will be taken, each animal will be micro-chipped to prevent multiple health screening on the same individuals and the liver will be examined macroscopically and via ultrasound, in order to detect the presence or absence of any EM cysts.

### Sample Screening

All blood and faecal samples will be sent to independent veterinary laboratories for testing. Any EM diagnosis would be made by the veterinary surgeon carrying out the health screening process. On discovery of any suspected EM infection that individual would be euthanised then post mortem investigation undertaken by independent animal pathologists. Most results are expected to be returned within 2-3 weeks of collection. One blood sample from each individual will be passed on for genetic screening.

### Animal Welfare and Release

Beavers will only be trapped in specifically designed beaver traps which have a low risk of animal injury and mortality. Set traps will be checked on a regular basis and only set if a trapping and veterinary team are available. Traps will not be set if temperature is due to fall below freezing for a number of hours or in very wet and windy weather. Positioning of traps will ensure no drowning or tipping risks are present. Beavers will only be handled and removed from traps by experienced personnel.

Trapped beavers will be transported to Edinburgh Zoo in specifically designed beaver transport crates. All veterinary work will be undertaken by experienced staff. Anaesthetic techniques and all proposed procedures have previously been undertaken. Each individual beaver will be rechecked prior to transportation and determined fit for release. For the release process the transport crates will be carried to the point of capture and the animal will be allowed to leave the crate in its own time.

### Report Writing

All findings will be presented including veterinary results and biological data on each individual beaver. It is noted that only a sample of the population will be screened therefore it will not be possible to categorically state negative results mean the population is free of a particular disease or parasite.

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