

Designing an appropriate surveillance strategy



If your quarantine/prevention measures fail, your surveillance strategy is all that stands between species of conservation interest or concern and a full blown reinvasion of the island that would take you back to square one.

Getting surveillance right requires significant on-going time commitments and carries with it an annual running cost. By preventing invasions, however, it will save a lot of time and money in the long run.

When planning a surveillance strategy as part of biosecurity ensure you consider the following:

a) **Behaviour of rats** in very low densities is less predictable than when an established population is in place, for example:

They are likely to **wander widely** to explore the island and search for other rodents to mate with. The rat may be nowhere near the point at which it left sign by the time of your next surveillance check. **If incursion is detected, you should immediately search across the island to check for further sign.**

A newly-arriving rat is unlikely to be food-stressed and might be most **attracted by good habitat**. Rodent motels are deployed with this in mind - as a particularly sheltered and safe environment they can make ideal habitat and be very attractive to rats.

b) You need to **plan for the quirks of an individual rat's behaviour** - the rat that has made it to the island might be wary of traps or be uninterested in chocolate flavoured wax. **Deploy as many different types of detection devices as possible.**

Detection techniques include:

- Flavoured wax blocks - e.g. chocolate, coconut, peanut butter, meat gravy, fish (plain wax is considered less reliable for use in surveillance).
- Tracking tunnels/plates or natural mud/sand traps
- Cameras
- Traps
- Visual searches for runs/droppings/chew marks on naturally occurring foods
- Hair traps
- UV light

In the UK surveillance cannot usually involve 'passive' killing of invasive species as permanent laying of poison or traps is not likely to be permitted. It is even more important, therefore, that surveillance devices are checked as frequently as possible so as to catch any incursion before it becomes an invasion.

It is worth noting that even international best practice still states that it is better to detect an incursion and launch a calculated response than to rely on permanent baiting.

The location of all permanent monitoring devices should be recorded using GPS and mapped for ease of reference when doing routine surveillance or if incursion response is required.

Appropriate surveillance strategies for generic island types.

Scenario	Recommended surveillance for rodents
<p>1. The island can be easily or regularly visited and is small enough to cover with a grid of detection devices - e.g. up to ca. 250ha. (Includes inhabited islands)</p>	<p>Deploy a broad array of detection devices over the whole island at about 1 or 2 per hectare and check each of them on every visit.</p> <p>Use, primarily, tracking tunnels and flavoured wax blocks. Put fresh tracking cards and wax out each time you visit, or freshen wax blocks by shaving off outer layers - the smell of the flavour (chocolate etc.) should be easily detectable. Wax blocks should be checked within around 7 days of being set. Ideally, tracking tunnels would be run for 7-10 days each time and checked at the end of this period. Bait them, e.g. with peanut butter. Supplement this with looking for feeding sign and footprints on sand or mud.</p> <p>Place wax/tracking cards inside permanent wooden boxes in preference to plastic stations. These can double up for use housing traps or poison if an incursion is detected.</p> <p>Monthly checking is advised. As an <u>absolute minimum</u> do 4 checks per year (about every 3 months). If you only do 4 checks a year and a pregnant female arrives, you can expect a breeding population to be establishing by your next check.</p>
<p>2. The island can be easily or regularly visited but is too large to cover with a grid of detection devices - e.g. larger than ca. 250ha. (Includes inhabited islands)</p>	<p>Deploy a broad array of detection devices in a range of likely habitats which are easy to access, and at possible incursion points (e.g. around the coastline). Supplement this with looking for feeding sign/footprints on sand or mud.</p> <p>Use, primarily, tracking tunnels and flavoured wax blocks. Put fresh tracking cards and wax out each time you visit, or freshen wax blocks by shaving off outer layers - the smell of the flavour (chocolate etc.) should be easily detectable. Wax blocks should be checked within around 7 days of being set. Ideally, tracking tunnels would be run for 7-10 days each time and checked at the end of this period. Bait them, e.g. with peanut butter.</p> <p>Place wax/tracking cards inside permanent wooden boxes in preference to plastic stations. These can double up for use housing traps or poison if an incursion is detected.</p> <p>Monthly checking is advised. As an <u>absolute minimum</u> do 4 checks per year (about every 3 months). If you only do 4 checks a year and a pregnant female arrives, you can expect a breeding population to be establishing by your next check.</p>

<p>3. The island has a known history of regular rodent incursions, or you expect the likelihood of future incursions to be high (Includes inhabited islands)</p>	<p>Given permanent trap use in the UK will be impractical, and permanent poison baiting considered poor practice, there must be exceptionally high conservation interest on the island for eradication to have been undertaken. Consider installing rodent-proof fences to create exclusion zones around sites of high conservation value. See Xcluder® (http://xcluder.co.nz/xcluder-fences/fences-designs.html) for more information. <u>N.B. if exclusion zones extend to the coast, they cannot be considered complete barriers. Surveillance must continue inside the fenced area, regardless of the fencing.</u></p> <p>Lay poison bait in all buildings on the island - concentrate on baiting during the winter months if permanent baiting is not possible. First generation anticoagulant rodenticides can be used for this if necessary. NB only certified trained personnel can handle bait (see Handling bait)</p> <p>A network of (empty) wooden trap tunnels should be in place across the entire island which can be used for trapping, baiting or placing tracking cards. Place them on most likely sites if a 1-2 per hectare grid.</p> <p>Run tracking tunnels for 5- 10 days and check at the end of this period. Wax blocks should also be checked within around 7 days of being set. Supplement this with searches for sign/footprints on sand/mud and at likely incursion points.</p> <p>Weigh up the costs of fewer, longer visits over shorter more frequent ones. How early do you need to detect and deal with an incursion in order to prevent catastrophic damage to the conservation interest? Where possible, fewer, longer visits are advised.</p>
<p>4. Remote and uninhabited islands which are seldom visited.</p>	<p>Ensure visits, when they do happen, give the team as long as possible on the island. Also ensure that the highest biosecurity standards are adhered to in order to prevent accidental introductions to the island.</p> <p>A network of (empty) wooden trap tunnels should be in place across the entire island which can be used for trapping, baiting or placing tracking cards. Place them in most likely sites if a 1-2 per hectare grid is not possible.</p> <p>When visiting run tracking tunnels for 5 nights or longer, focusing on likely areas if necessary. Check the tunnels at the end of this period. Supplement searches by using flavoured wax (these should be checked within c. 7 days of being set) and look for feeding sign/footprints on sand/mud and at incursion points.</p>
<p>5. At least 1 native rodent exists on the island and you want to detect new species arriving.</p>	<p>Carefully select detection devices to maximise the chances of distinguishing between native species and invading species - e.g. tracking tunnels, Bovril wax. Do not use rodenticides pre-emptively.</p> <p>Operate appropriate traps when visiting (e.g. set for rats if resident mice/voles are present) and look for feeding sign.</p>

Carefully archive all devices that display some form of interaction with a species (e.g. tracking cards, chewed wax block) noting exact locations, dates and who interpreted them. This information may be useful to refer to when dealing with future invasion/incursion responses

Create a biosecurity log to detail all suspicious sign or sightings, **including false alarms**, near-misses or other events occurring as part of the quarantine actions.