Prevention of INNS Establishment (Actions-based metric)

Metric purpose and scope

This metric aims to estimate the number of potentially invasive non-native species prevented from establishing in Great Britain, based on recorded management actions. It is designed to provide a timely, action-based assessment of prevention activity, complementing longer-term outcome measures. As we do not have the ability to predict the potential invasiveness or establishment ability for all non-native species, we are currently assuming all incursions of non-native species, may have the potential to become invasive. This approach is intended as an interim methodology and will be reviewed and refined over time as new evidence, data and analytical methods become available.

Setting target level

Given these limitations, a pragmatic and consistent approach has been adopted to estimate progress towards the target. This treats all non-native species incursions as potentially invasive and uses recorded management actions as a proxy for prevention, providing a simple but robust basis for tracking activity in the absence of reliable predictive data.

Data from 1970–2000 indicates that approximately 14 new NNS establish in GB every year, of which 10–15% are likely to become invasive.[1] This means that approximately two potentially invasive NNS are likely to establish in GB each year. To meet the target, we will therefore need to prevent at least one invasive or potentially invasive non-native species from establishing in GB per year.

Methodology overview

The methodology aggregates actions across the invasion pathway— contingency responses, and eradications—and translates these into an estimate of the number of species prevented from establishing. This requires applying rules to define what constitutes a prevention event (e.g. combining multiple actions for the same species) and making assumptions about the effectiveness of interventions.

The metric draws on multiple data sources, including records submitted via iRecord, reports received through the NNSS (e.g. alert emails and direct correspondence), and

[1] https://www.gov.uk/government/publications/invasive-non-native-species-environment-act-target-delivery-plan/invasive-non-native-species-environment-act-target-delivery-plan

operational datasets such as those held by the UK Species Inventory (UKSI). As such, the metric provides a structured but simplified representation of prevention activity. The methodology will be reviewed periodically to reflect new evidence, improved data availability and emerging approaches, and may be refined over time as additional data highlight areas for improvement or revision.

Data underpinning this metric are primarily collected and maintained by the UK Centre for Ecology & Hydrology (UKCEH), working with partners including the GB Non-Native Species Secretariat (GBNNSS) and associated programmes. UKCEH plays a central role in collating evidence on new species arrivals, responses, and eradication activity, which forms the basis for developing and operationalising this actions-based metric.

Prevention can be achieved by:

(i) managing pathways of introduction,
(ii) intercepting species before they get into the wild,
(iii) responding to them when they do get into the wild, or
(iv) eradicating them as they start to establish/before they become too widespread (Figure 1).

At present, data are primarily available, and actions are systematically recorded, for stages (iii) and (iv), while stages (i) and (ii) could potentially also inform the metric as data availability improves.

By measuring each of these we can develop an action-based metric for the number of non-native (and so potentially invasive) species prevented from establishing.

Our aim will be to demonstrate that these actions have prevented the establishment of at least five invasive, or potentially invasive, non-native species over the five-year period. To provide an assessment by 2030, the metric will need to track actions from at least 2024 onwards.

To track this metric, we will use data on new arrivals and responses to them.

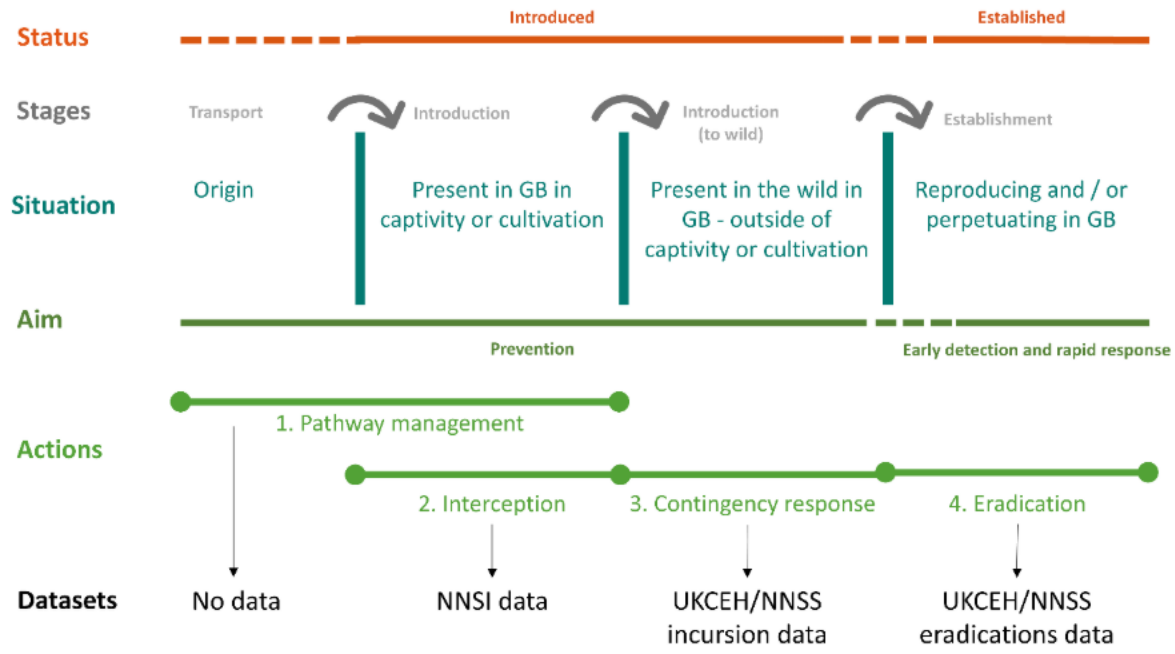

Figure 1. Management action linked to invasion stage and potential datasets. Abbreviations: GB = Great Britain; INNS = invasive non-native species; NNSI = Non-Native Species Inspectorate; UKCEH = UK Centre for Ecology & Hydrology.

The actions in this framework and the data that can be used to track their contribution to preventing establishment are discussed in more detail below:

i. **Pathway management**: used to prevent the introduction of species into GB and to prevent introduction to the wild once in GB.

   - It is not yet possible to measure this action because it is difficult to link pathway management actions directly to prevention events.

ii. **Interceptions**: used to stop species at the border and post-border before they reach the wild, e.g. detecting/removing contaminants on vehicles/items being brought into GB.

   - Interception data is not currently collected for this purpose and does not inform the metric at this time.

iii. **Contingency response**: used to remove new species detected outside of captivity, cultivation or other forms of containment before they have a chance of establishing.

   - The UK Centre for Ecology & Hydrology (UKCEH) and the NNSS track new species detected and the response to them which, with work, could provide the data required.

- Multiple responses to the same species would be counted as one prevention event.

iv. **Eradication**: used to remove species that have established or are in the process of establishing.

- Every GB-level eradication would count towards the prevention target as one species prevented from establishment.
- Multiple eradications of the same species would be counted as one prevention event.

The number of species prevented through the section two actions above, contingency response and eradication from establishing through each of the above actions would be combined to produce an overall estimate of the total number of species prevented. If action is taken multiple times in the five-year period to prevent the establishment of the same species, this would be counted as one species being prevented over that period.

Key caveats

While action against known (but not yet established) invasive species will count directly towards the metric, and we have identified a range of potentially invasive non-native species through horizon scanning, at present, we are counting all non-native species within this action-based metric. Therefore, we are currently inherently assuming that all non-native species may have the potential to become invasive, even if not otherwise known to be invasive or potentially invasive, to maintain precaution and ensure we prevent potential INNS.

We recognise that this assumption may not reflect the real-life potential of each non-native species to become invasive if left unchecked; however, we do not currently have the ability to predict invasive potential for all non-native species. This metric relies on a combination of developing datasets and assumptions to link management actions to prevention outcomes. It provides a timelier assessment of progress than outcome-based measures but is subject to greater uncertainty, particularly as it depends in part on self-reported operational data and assumptions about whether species would have established in the absence of intervention.

The methodology aggregates actions across the invasion pathway— contingency responses and eradications—and converts these into an estimate of the number of species prevented from establishing. This requires applying rules to define what constitutes a prevention event (e.g. combining multiple actions for the same species) and making assumptions about the effectiveness of interventions. As a result, the metric reflects a structured but simplified representation of complex ecological and operational processes.

Data gaps further affect both completeness and reliability. Where contingency responses, or eradication actions are incompletely or inconsistently recorded, prevention events may be missed, leading to underestimation. Variation in data coverage across action types also introduces imbalance, with some interventions (e.g. contingency response) better represented than others (e.g. pathway management). In addition, gaps in detection and reporting—particularly for newly arrived species—mean that not all relevant events are captured.

There is also a need for further work to develop a framework to estimate how many contingency responses equate to a prevention event, which will vary by species and context, alongside ongoing risks of inconsistent reporting or double counting. Furthermore, pathway management and interception, cannot yet be robustly quantified in terms of direct prevention outcomes and are therefore not directly included in the metric

As a result, the metric should be interpreted as an indicative measure of prevention effort and effectiveness, rather than a definitive count of species prevented from establishing.