HIGH-RISK SITE SURVEILLANCE ANNUAL REPORT 2012–2013

High Risk Site Surveillance (HRSS) is a post-border risk-pathway-focused surveillance programme operated by the Ministry for Primary Industries (MPI), targeting vegetation (primarily trees and shrubs) and wooden materials. The primary objective of the HRSS programme is to detect new plant pests that pose a biosecurity risk or may impact on trees and shrubs (e.g., plantation forests, native forests and urban trees).

Methods

The HRSS programme identifies high-risk sites (where the risk of introduced organisms is high owing to movement of tourists or cargo) and groups them into Risk Site Areas (RSAs) that include ports, Transitional Facilities, camping grounds, tourist venues and military bases, based upon identified clusters of sites. Risk and required detection probability are calculated to improve allocation of surveillance resources. Surveillance transects are assigned within RSAs to cover areas of potential host vegetation and provide discrete, repeatable packets of intensive surveillance. Field surveyors thoroughly inspect trees, shrubs and woody material within these transects. Suspect samples that may (in the opinion of the field surveyor) be a biosecurity risk are collected and forwarded to the appropriate laboratory for identification. New records are recorded in MPI's Plant Pest Information Network (PPIN) database and reported for further appropriate action.

HRSS is administered by AsureQuality on behalf of MPI. SPS Biosecurity is responsible for most of the required field work throughout New Zealand, but AsureQuality carries out surveillance in the Wanganui-Manawatu region. Methods used in the HRSS programme are further detailed in Stevens (2011).

As part of a commitment to continual improvement a workshop was held early in the season to provide training for field surveyors. During this workshop concerns were raised about the risk of new organisms (with symptoms similar to already-established diseases) establishing if field surveyors assume that what they are seeing is an established organism. In response to this the field surveyors raised their sample submission numbers this season. This resulted in a significantly increased workload for the lab staff.

Changes made to the risk model last year to enable a risk factor to be allocated to each individual RSA throughout New Zealand were maintained this season. All risk sites and calculated risk are mapped in GIS. Allocating risk in this manner allows a greater level of accuracy in planning the allocation of scarce surveillance resources and improves effectiveness of the programme.

Probability of detection in HRSS is based on Carter (1989). Using this model, it is clear that additional repeated surveys within RSAs further increase the detection probability. Additionally, as the risk of incursion is ongoing, repeated inspections are more likely to find incursions in a smaller population. For these reasons the RSAs with the highest calculated risk were inspected up to four times during the survey season.

Results

FIELD SURVEILLANCE

During the 2012–2013 season 489 RSAs and 7001 transects were surveyed. Most surveillance was carried out around Transitional Facilities or their associated vegetation-rich areas (VRAs) (91 percent of all transects).

Table 1 shows an example of calculated biosecurity risk compared to the actual transect inspections completed by region, for the 10 regions most at risk. It shows that Auckland has the highest biosecurity risk in the country; this is directly related to the volume of goods and passengers entering the country and/or being unloaded there.

TABLE 1: CALCULATED REGIONAL RISK COMPARED WITH PERCENTAGE OF TRANSECT INSPECTIONS COMPLETED IN 2012–2013

REGION	PERCENTAGE CALCULATED BIOSECURITY RISK	PERCENTAGE OF COMPLETED TRANSECT INSPECTIONS
Auckland	64.36%	47.94%
Mid-Canterbury	11.36%	5.48%
Wellington	5.78%	6.96%
Bay of Plenty	5.62%	11.24%
Hawke's Bay	2.69%	2.63%
Waikato	1.78%	4.20%
Dunedin	1.70%	2.19%
Nelson	0.97%	1.86%
Taranaki	0.97%	1.70%
Wanganui	0.92%	2.20%

Source: Fraser *et al.*, 2013

Table 2 is a summary of the detection probabilities for the major risk ports. Note that while detection probabilities have been increased in Auckland (owing to the amount of residual biosecurity risk there), changes have been made in other parts of the country to bring the required detection more into line with the calculated risk.

TABLE 2: SUMMARY OF DETECTION PROBABILITIES FOR THE MAJOR RISK PORTS, 2012–2013

SITE RISK	MEAN DETECTION PROBABILITY 2011–2012	MEAN DETECTION PROBABILITY 2012–2013
Auckland seaport	87%	91%
Auckland Airport/ Auckland Metro	76%	89%
Tauranga seaport	89%	93%
Wellington seaport/ Airport	63%	55%
Christchurch Airport	69%	55%
Lyttleton seaport	62%	57%

Source: Fraser *et al.*, 2013

DIAGNOSTICS

Most diagnostic support for the HRSS programme is provided by Scion's Forest Health Reference Laboratory (FHRL). MPI's Investigation and Diagnostic Centre, Plant Health and Environment Laboratory (IDC-PHEL) undertook diagnostics for samples not associated with trees and shrubs or suspected of containing viruses, bacteria or nematodes and was responsible for validation for all new to New Zealand identifications.

From 1 July 2012 to 28 June 2013 the diagnostic labs were sent 1106 samples (**Table 3**). These were divided into potential risk organisms and identifications made from these specimens. Insect specimens and plant samples showing insect damage were the most common (47 percent of all samples received over the year). Fungi were identified in 33 percent of samples, but many of the samples with inconclusive results were further processed by the pathology laboratory to rule out fungi as a cause of damage. In 20 percent of samples, no insect or pathogen could be found or identified. A total of 1627 identifications were made during the season, of which about 76 percent were made to species level. October and November 2012 were the busiest months, with over 20 percent of all submissions processed during this time.

TABLE 3: SAMPLES RECEIVED BY FHRL AND PHEL DURING THE 2012–2013 SEASON

SAMPLE TYPE	PERCENTAGE
Entomology	47%
Mycology	33%
Inconclusive or other	20%
Total	**100%**

Source: Fraser *et al.*, 2013

From the identifications a total of 212 PPIN reports were forwarded to MPI. All species identifications made by FHRL were completed or fully evaluated for their potential to be a biosecurity threat within 20 days, and 88 percent of insect identifications were completed within 10 days.

HRSS generated 81 sample submissions directly to the IDC-PHEL. These samples generated a total of 116 organism identifications. Sixteen PPIN reports were generated out of the submissions directly reported to IDC-PHEL.

FHRL reported that submission quality from the field was of the same high standard as last year.

Discussion

Numbers of significant samples identified provide one measure of the effectiveness of any surveillance programme. **Table 4** shows the number of samples received and significant identifications (either new to New Zealand, new to science, new host associations or new distributions) made in 2012–2013. The number of significant identifications is up on 2011–2012.

TABLE 4: DIAGNOSTIC TRENDS BETWEEN 2011 AND 2013 (FHRL + PHEL))

TYPE	2011–2012	2012–2013
Submissions	740	1 106
Identifications	966	1 627
New to New Zealand	5	6
Significant to PPIN	147	228
Significant detections (% of total submissions)	20%	21%

Source: Fraser *et al.*, 2013

Conclusion

As demonstrated by the number of significant detections reported to MPI, the HRSS programme continues to provide effective detections of plant pests potentially posing a biosecurity risk. Changes made to the programme seem to have maintained the improved detection of new to New Zealand organisms. While the proportion of submissions that are "significant to PPIN" has remained the same, the total number of significant detections has increased owing to the increased number of samples submitted. These results will be used to further refine the HRSS programme for the upcoming season.

The efficiency of the programme continues to be demonstrated by the ability to allocate surveillance resources to areas of known risk magnitude and with calculated detection probabilities for the highest-risk sites.

REFERENCES

Carter PCS (1989). Risk Assessment and Pest Detection Surveys for Exotic Pests and Diseases which threaten Commercial Forestry in New Zealand. *New Zealand Journal of Forestry Science* 19(2/3), 353–374.

Fraser A, Kane W, Sopow S, Bulman L, Rogan B, Bennett S, Flynn A (2013). High Risk Site Surveillance: Annual Report 2012–2013. Programme report to Ministry for Primary Industries.

Stevens P (2011). High Risk Site Surveillance Annual Report 2010–2011. *Surveillance* 38(3), 72–74.

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