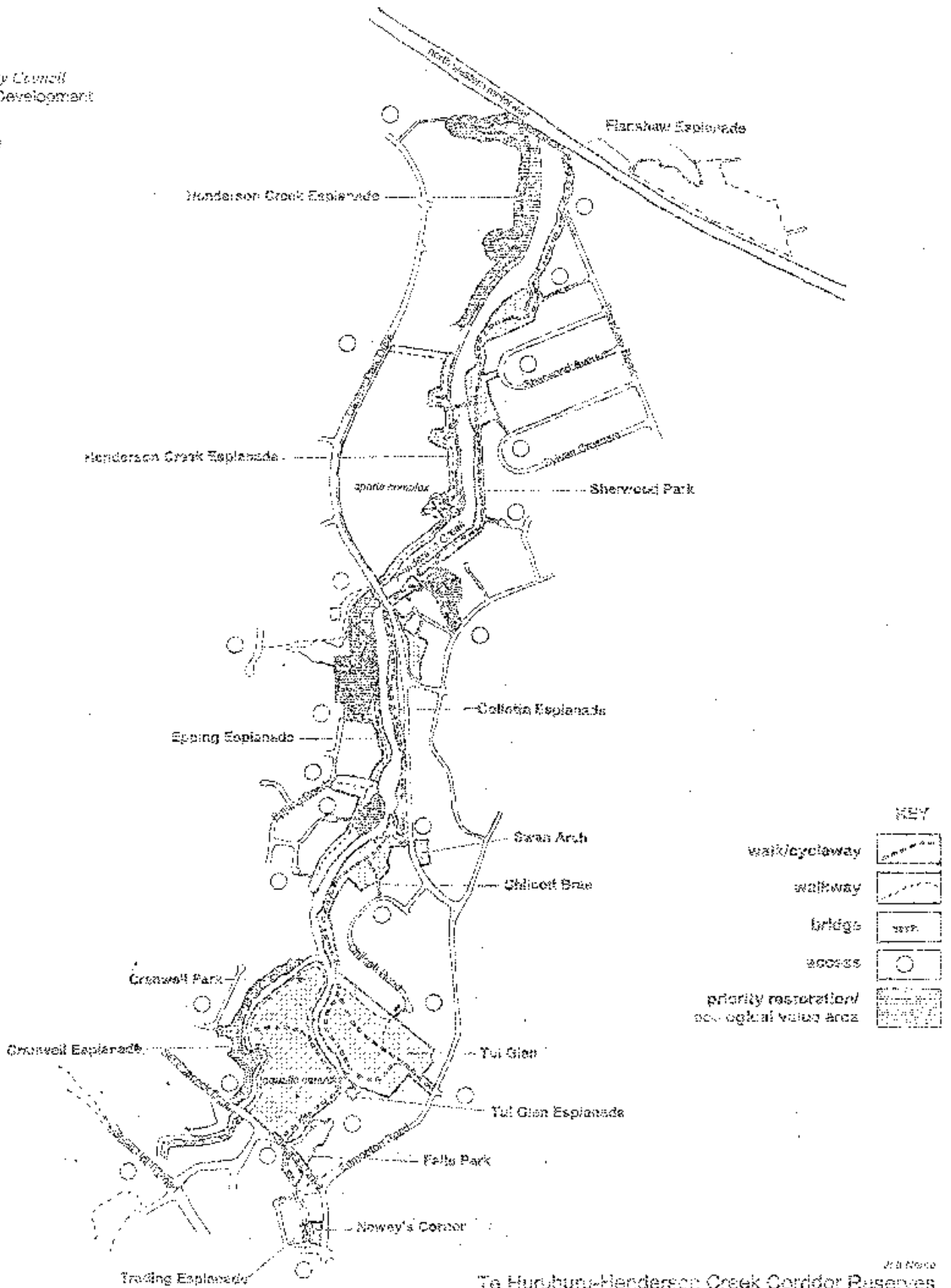




**Whitaker City Council
Landscape Development**

101 Litchfield Road
Private Bag 6501 38
Henderson
Whitaker City



KEY

walk/cyclaway	
walkway	
bridge	
access	
priority restoration/ ecological valued area	

**To Huruuru-Henderson Creek Corridor Reserves
Landscape Concept Plan**

Scale 1:7500 (A2)

Do not discuss this plan broadly
except in the presence of the
Planning Committee or Council

Date	Sheet No.
01/10	1
02/10	Date
Mark McMillan	14/10/10
	10/10/10

**MAF Bio security – Pam Project
Ministry of Agriculture and Forestry's Painted Apple Moth Project
For Waitakere City Council
March - April 04**

1. The aerial operation scheduled to treat the Ranui/Swanson area, and due to commence on the 30 March 2004 was cancelled due to unfavourable weather conditions.

The 254 hectares was treated and completed on 31 March 2004.

The second to last aerial operation commenced and was completed on 20 April 2004, and covered 254 hectares in the Ranui/Swanson area.

The final aerial operation is scheduled for the 11 May 2004, and will again cover the 254 hectares mentioned above.

2. Trap Catch results for March – April 2004 were zero.
3. Trapping intensifications were reduced in some areas with 112 traps being removed. A new intensification grid was established with 81 traps being added elsewhere. More traps were incorporated into the area to establish a more uniformed grid pattern. This was completed by 23 April 2004, and moths were placed in all traps.

Trapping is being done twice weekly in an area of 2km from the last find in Mt Eden.

4. No ground surveying was undertaken during March and April 2004.
5. The release of the Sterile Male moths is still continuing. However, with the arrival of cooler weather, this activity will conclude this week with the release of approximately 3000 moths. There are still currently 2000 moths being released in the three locations. The releases have now been broken into twice weekly releases, rather than once a week.

MAF Bio security – Pam Project
Ministry of Agriculture and Forestry's Painted Apple Moth Project
For Waitakere City Council
May 04

6. The aerial operation scheduled to treat the Ranui/Swanson area, and due to commence on the 11 May 2004 was postponed due to unfavourable weather conditions.

The 254 hectares was treated and completed on 13 May 2004.

7. Trap Catch results for May 2004 was zero.
8. No new changes to the trapping grid in the West Auckland region. Trapping still done on a weekly basis, overseeing the 1880 traps.
9. Trapping is still being carried out on a twice weekly basis in an area of 2km from the last find in Mt Eden.
10. No ground surveying was undertaken during May 2004.
11. The release of the Sterile Male moths was completed on the 28 April 2004. At this time there is no intention of recommencing these releases come next Spring.

Completed Aerial Operations for the Summer Programme

Spray No:	Date Scheduled	Date Applied	Date Completed	Total Area Covered (hectares)
Spray 27	11 Nov	11 Nov	19 Nov	6500
Spray 28	1 Dec	1 Dec	1 Dec	946
Spray 29	9 Dec	12 Dec	12 Dec	56
Spray 30	18 Dec	18 Dec	18 Dec	946
Spray 31	29 Dec	31 Dec	31 Dec	56
Spray 32	8 January 04	9 January	9 January	946
Spray 33	18 January 04	Not Done	Not Done	Not Done
Spray 34	29 January 04	29 January 04	29 January 04	946
Spray 35	10 February 04	10 February 04	10 February 04	56
Spray 36	18 February 04	18 February 04	23 February 04	946
Spray 37	9 March 04	9 March 04	9 March 04	700
Spray 38	30 March 04	31 March 04	31 March 04	254
Spray 39	20 April 04	20 April 04	20 April 04	254
Spray 40	11 May 04	13 May 04	13 May 04	254

Assessment of the potential health impacts
of the 'Painted Apple Moth' aerial
spraying programme, Auckland

for the New Zealand Ministry of Health

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February 2004

Executive summary

Background

Since January 2002, the Ministry of Agriculture and Forestry (MAF) has been undertaking aerial applications of Foray 48B in Auckland in an effort to eradicate the Painted Apple Moth. Foray 48B is a commercial insecticide containing *Bacillus thuringiensis (Bt)*, a spore-producing bacterium that is toxic to certain insects. The Ministry of Health asked researchers at the Wellington School of Medicine, to

“...receive, collect, and summarize reports from the public, community groups, territorial authorities, Aer Aqua and the Auckland Regional Public Health Service (as well as other stakeholders, community groups, organisations and individuals) on the health concerns, symptoms and effects associated with the Foray 48B aerial spraying programme ... review existing scientific knowledge relevant to these health concerns symptoms and effects, and recommend (but not carry out) scientifically robust methods of further study.”

We report the views of those who participated in meetings or responded to our requests for submissions as faithfully as possible. These methods allow us to describe the *range* of reported health effects, symptoms, and concerns in the community. However, using these methods we cannot determine the frequency of reported health effects, symptoms, and concerns in the wider community.

Focus groups

The study included four formal focus groups, as well as additional community data gained from various interactions within community networks around the Waitakere City Council. The data gathered in each forum builds a consistent picture; that the aerial spray programme is reported to have had multiple impacts on the health, well-being and everyday life of many Waitakere City residents. Those with existing conditions, such as asthma and hay fever, often reported that these conditions were aggravated following exposure to spray.

Many expressed concern for the young and elderly. Some expressed uncertainty about health effects in future generations. Other impacts included disruption of day to day life, compounded by lack of certainty about which day the spraying would occur. All participants reported staying indoors and closing windows when the spraying occurred.

There were frustrations over having to wash cars, windows and laundry. In many cases, we were told, the disruptions of everyday life were exacerbated by a lack of timely and meaningful information about what to expect, the spray times, and the spray ingredients. We were told that a lack of information has also resulted in increased uncertainty and concern about the sprays toxicity, and a decreased confidence in government.

All of the focus groups reported concerns over the effectiveness, impartiality and fairness of the MAF health service and some people reported they are reluctant to use the services.

Health concerns reported in submissions

In response to a call for submissions, the most frequently reported symptoms were

- Irritant symptoms: sore throat, headache, blocked nose (25% of all reported symptoms)
- Respiratory symptoms: chest tightness, asthma exacerbation, cough (16%)
- Gastrointestinal symptoms: diarrhoea, vomiting, stomach cramps (14%)
- Flu-like symptoms: fever, malaise, swollen glands (13%)
- Skin rash (9%)

Similar symptoms have been reported in other studies of workers and communities exposed to aerial spraying of products containing *Bt*, both in New Zealand and overseas.

Review of scientific literature

Workers and communities exposed to *Bt* products have reported acute irritant symptoms (such as sore throat, headache, blocked nose). More chronic symptoms, such as exacerbations of asthma, skin rashes or flu-like symptoms have less frequently been reported.

Several studies of communities exposed to aerial spraying of *Bt* products have been carried out in New Zealand, Canada, and North America.

These have not shown any association between exposure and health effects. We do not question the accuracy of these findings, which do provide some reassurance. However, the level of reassurance that can be derived from these results depends upon the quality and size of the studies. All of the epidemiological studies that we have reviewed have limitations, and they have limited ability to detect effects that occur in a small proportion of exposed people.

We recommend that further epidemiological studies are carried out, with sufficient statistical power to provide adequate reassurance to exposed communities in the event that no health effects are found.

Risk assessments

The prediction of the Auckland DHB risk assessment (for MAF, 2002) that: "...some people may complain of minor skin, eye and upper respiratory tract irritation, or aggravation of existing asthma or allergies..." (Kalemba et al. 2002) was accurate.

The Environmental Risk Management Authority (ERMA) assessment of Bactur 48LC appears to have been based, at least in part, on the questionable assumption that short term irritant effects of *Bt* products are only seen in laboratory animals or workers exposed to relatively high doses – and do not occur in communities exposed to aerial spraying of *Bt* products.

We recommend that the safety of biological insecticides be reassessed by ERMA and that Workplace Exposure Standards for bioaerosols be developed in New Zealand.

Exposure assessments

The pattern of reported acute and chronic symptoms in workers and communities exposed to Foray 48B is consistent with the known effects of bioaerosol exposure. This has not previously been noted and bioaerosol effects have not been specifically addressed by previous studies. When sprayed from aircraft, *Bt* products are detectable in indoor and outdoor air as very fine acidic "bioaerosol" particles that may be inhaled deep into the lungs. This raises the theoretical potential for *Bt* products to cause a range of chronic respiratory diseases that have been documented in people exposed to bioaerosols in the workplace.

The level of exposure causing occupational diseases is probably substantially higher than that typically experienced by New Zealand communities exposed to *Bt* aerial spraying programmes. On the other hand, the most sensitive individuals tend to avoid occupations that lead to bioaerosol exposure, so that studies of workers may not give a true picture of the likely effect in communities. As far as we are aware, there are no studies of the potential long term effects of exposure to *Bt* products from aerial spraying operations on either communities or workers.

Provided that communities are supportive of the proposal, we recommend that such studies are carried out in New Zealand.

In a study of bioaerosol effects in the community, total bacteria were measured at concentrations of 5,000 to 10,000 cfu/m³. This level was sufficient to cause detectable health effects in that population. Only two published studies have assessed exposure levels during spraying of *Bt*. The first of these reported levels of up to 4000 cfu/m³ in the "general spray area" while the second reported levels of up to 1600 cfu/m³ (which was the upper limit of detection in that study).

We recommend further study of exposure to *Bt* under New Zealand conditions, including detailed computer modelling of previous exposures.

The literature indicates that *Bt* products have the potential to cause health impacts in sensitive individuals. Among other mechanisms, bacterial toxins can cause health effects by stimulating innate immune responses. Effects on health via this mechanism are not specific to a particular species of bacteria. Recent results suggest that this mechanism can be triggered by Gram positive bacteria and their spores, which contain a class of chemical called peptidoglycans. *Bt* products may cause allergy to chemical or biological components of the spray. This is likely to affect a small proportion of exposed people, but clinical testing of a representative sample of people could quantify this.

We recommend immunological testing of a representative sample of people from the community.