

Wide-area Wasp Control With Bait Stations

Richard Toft
Entecol Ltd, Nelson

Eric Edwards
DOC, Head Office



Social Wasps in New Zealand

- Two *Vespula* wasps, two *Polistes* wasps established
- German wasps arrived 1940's, common wasps probably established in 1970's
- Spread throughout NZ in two waves
- New Zealand has no native species of social wasps or bees → land of wasp-ortunity!
- Honeydew in the beech forests of South Island is a wasp super-fuel
 - Highest density of wasps in the world
 - 20 nests in area the size of football field



Wasps: Predators & Competitors

If you put together all the wasps in honeydew beech forests they would weigh more than the weight of birds, rodents and stoats combined
(*Thomas et al 1990*)



Survival model predicts that wasp abundance would need to be reduced by 80-89% to protect orb-web spiders.
(*Toft & Rees 1998*)

Wasps: Predators & Competitors

Wasps remove >90%
of the standing crop
of honeydew for 5
months of the year
(*Beggs 2001*)



A New Honeydew Provider

Giant willow aphids
appear to be fuelling
wasp populations in
new areas



Killing Wasp Nests

- Direct application of powdered insecticide
 - Have to find the nests first
 - Can only treat those nests you can reach
 - Can be hazardous!
 - Not practical for large areas
- Toxic baiting
 - Wasps carry the insecticide to the nest themselves
 - All nests in area at risk
 - Large areas treatable with grid of bait stations



Toxic Baiting of Wasps – A History

- Mirex (1%) used in protein baits against German wasps in the 1970's
 - Persistent (10 yr half-life), bioconcentrates
 - Suspected carcinogen
 - Phased out
- 1080 (1%) trialled successfully against *Vespula* wasps in late 1980's/90's
 - Highly toxic to vertebrates
 - Hazardous to field staff
- Finitron (0.5% sulfluramid) developed commercially in late 1990's
 - Concern over risk of molecule in humans
 - Production ceased 2001



Toxic Baiting With Fipronil

- Landcare Research began work trialling fipronil in wasp baits in the 2000's
- Trial results very promising
 - Highly effective against wasps
 - Very low toxicity to mammals
- Ongoing trial work on effective bait spacing undertaken by DOC at Lake Rotoiti
- Entecol continued work on an improved bait matrix and bait stations specifically for wasps



2015: Wasp Baiting Pilot Trial

Collaboration between DOC, BASF (NZ) and Entecol to trial a wide-area wasp baiting system utilising a protein bait with fipronil:

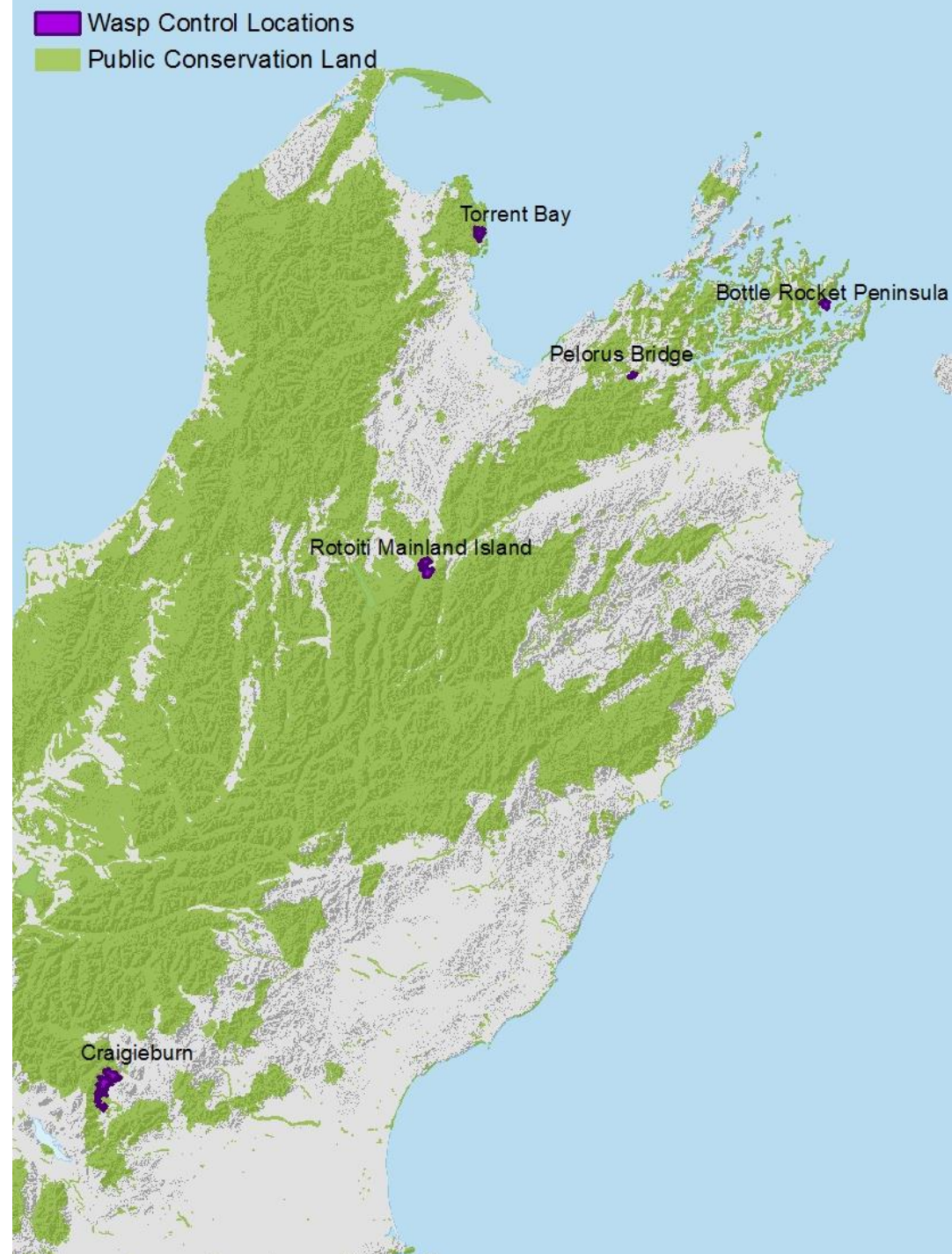
- Effective at controlling wasps?
- Able to provide significant benefits for native biodiversity (90% reduction in wasps)?
- Of low risk to non-targets (especially honeybees)
- A system involving good stewardship of a potent ecotoxin?



Wasp Baiting Pilot Study

Five trial sites
managed by DOC in
collaboration with
supporting groups:

- Project Janszoon
- Forest & Bird
- Friends of Rotoiti
- WERC - Waimakariri
Environment & Recreation
Committee
- ZIP – Zero Invasive
Predators




Methods

- Sites from 217 ha to 2,477 ha
- Bait stations on 300 x 50 m grid (higher density at smaller sites)
- No pre-baiting used
- Bait put out mid-late February for no more than 7 days
- Wasp nest traffic rates counted before and 1-week after treatment
- Standardised honeydew measurements taken before and after treatment



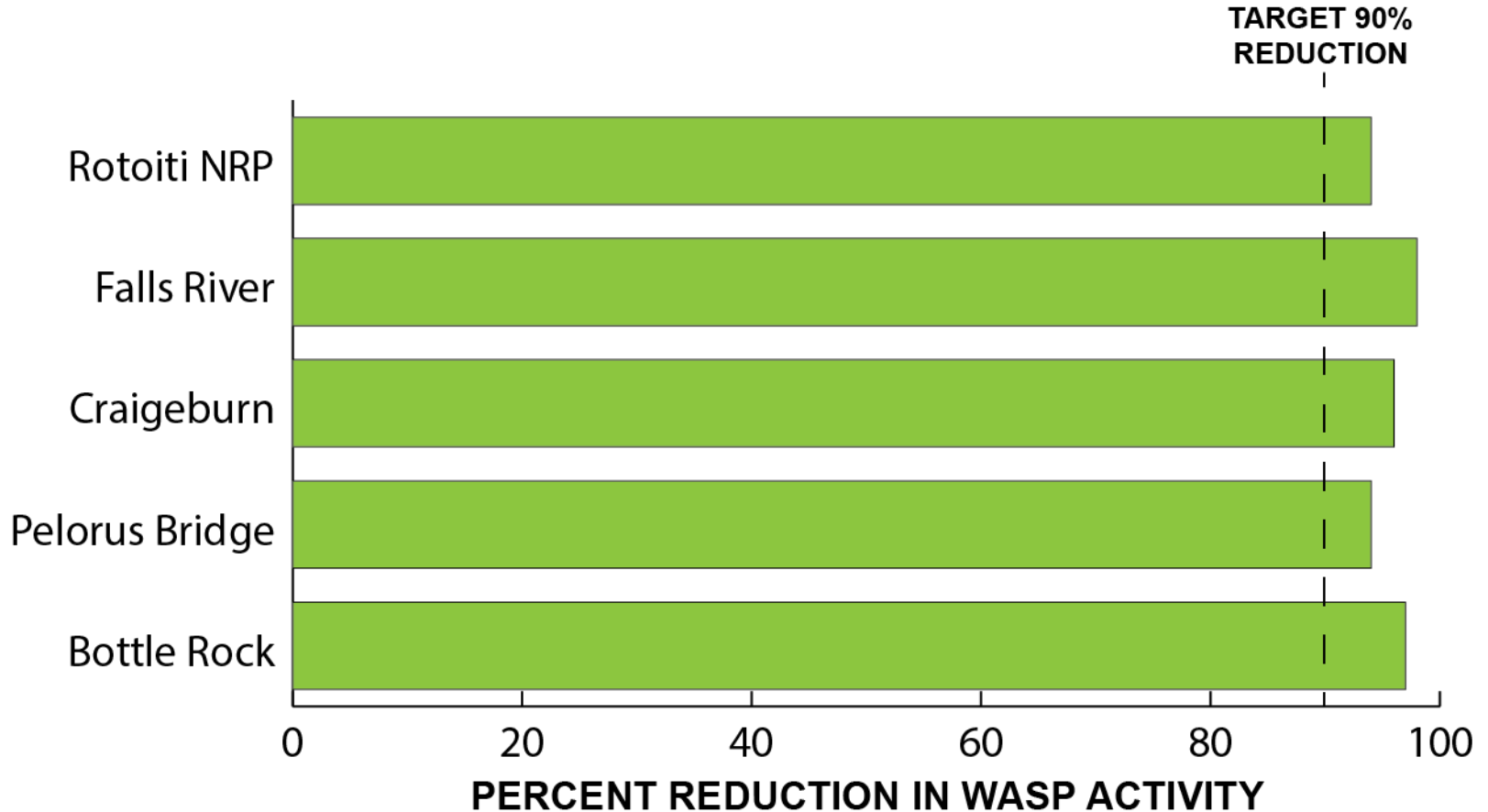
Wasptek Bait Stations

- 
- A hand is holding a bright yellow, rectangular bait station. The station is open, revealing a small white box inside. The white box contains a blue, crumbly substance, which is the bait. The background is a blurred natural setting with green foliage and a tree trunk.
- Light-weight
 - Easily seen
 - Encloses around bait, providing protection
 - To be partnered with disposable, measuring bait wells

Results – Treatment Blocks

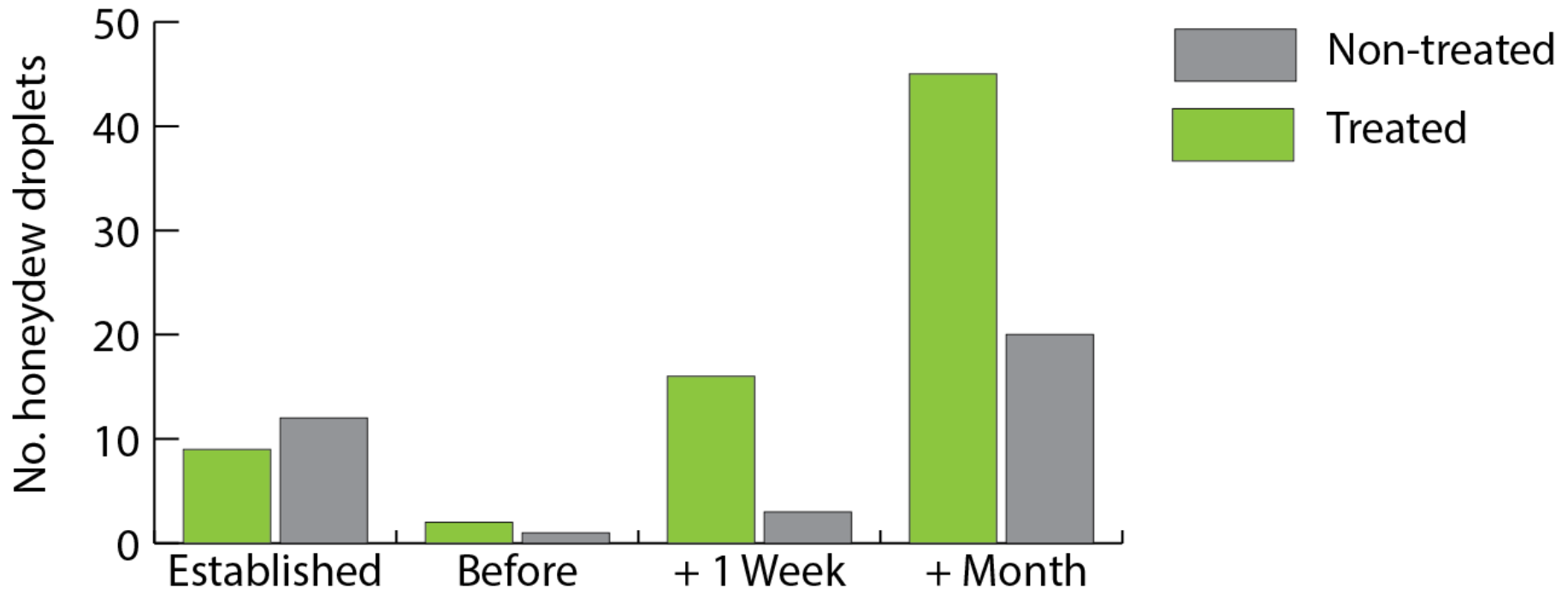
	before treatment	after treatment	month after treatment	% reduction in activity	% month later
Rotoiti Nature Recovery Project	41.1	1.9	0.7	94% \pm SE 3%	98% \pm SE 2%
Falls River (Abel Tasman NP)	45.5	0.5	0	98% \pm SE 1%	100%
Craigieburn (Arthurs Pass)	60.5	2.2	0	96% \pm SE 1%	100%
Pelorus Bridge (Marlborough)	79.2	5.1	-	94% \pm SE 4%	-
Bottle Rock Peninsula (Marlborough Sounds)	70.6	2.3	-	97% \pm SE 3%	-
MEAN 95.8% REDUCTION					

Results – Treatment Blocks



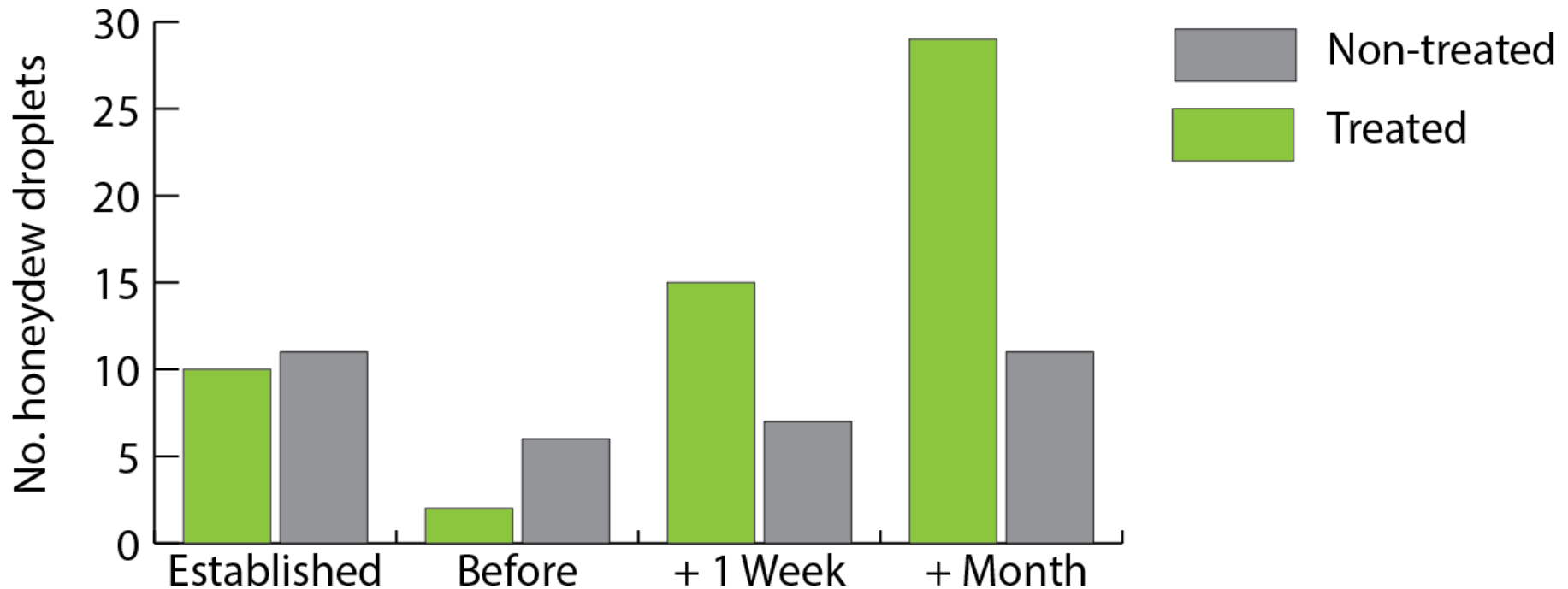
Results – Honeydew Recovery

Lake Rotoiti



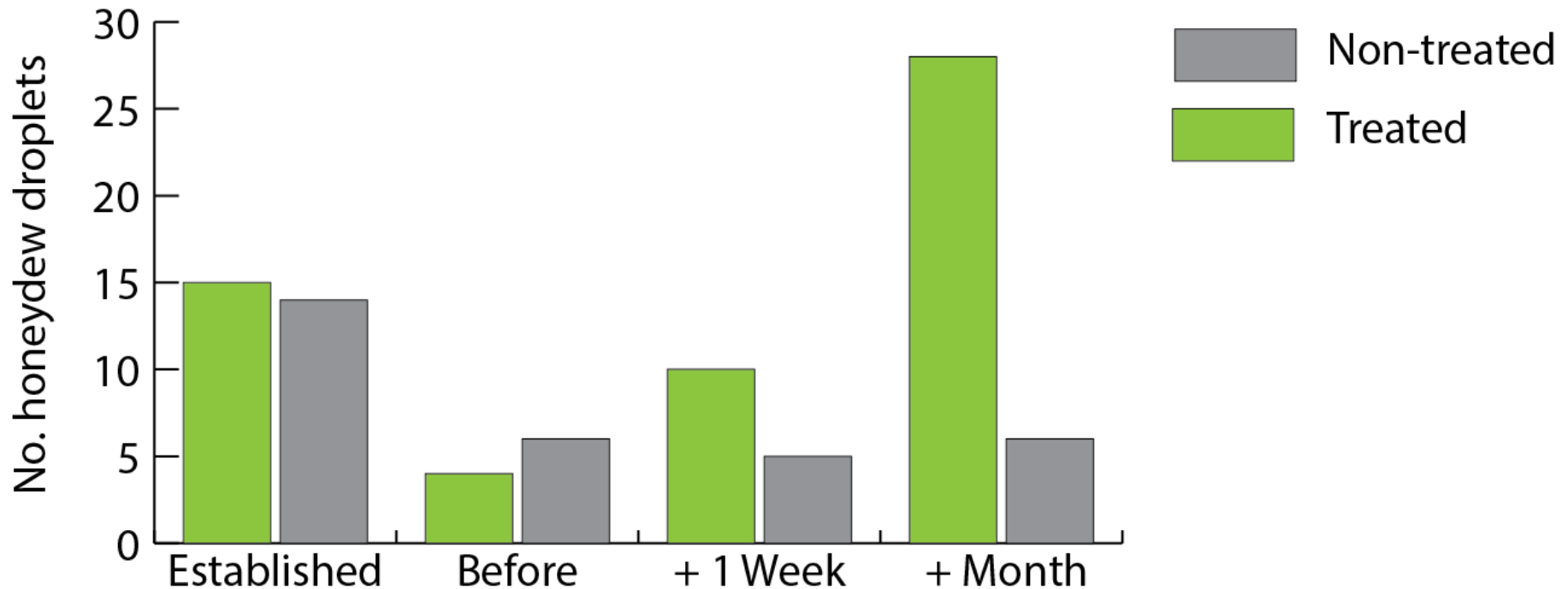
Results – Honeydew Recovery

Falls River - Abel Tasman NP



Results – Honeydew Recovery

Craigeburn



Summary Findings

- Baiting system provides highly effective wasp control over large areas
- Wasps reduced below the ecological damage thresholds with single application of wasp bait
- More bees seen working honeydew after wasps removed
- Systems used were safe and minimised exposure of non-targets to the bait



Getting Ready for 2016

- DOC investigating new sites to use wasp baiting system
 - Larger sites for biodiversity protection e.g. Rangitoto Island
 - Key walking tracks e.g. Abel Tasman
 - Other high use recreation sites (campgrounds, huts, picnic areas, amenities)
- Progressing plans to enable wider use of the wasp baiting system outside DOC
- Understanding needs of potential users, and integrating that with good stewardship controls

Acknowledgements

Department of Conservation

- Especially Nik Joice

BASF

WERC

Friends of Rotoiti

Forest & Bird

Janszoon Trust

ZIP –Zero Invasive Predators



Interested in Wasp Control?



Send me an email:

richard@entecol.co.nz

