

Blossom Visitor Data Collection - Training Objectives

Objective	Tasks	Resources	Assessment
1. Identify site and transect plants	<ul style="list-style-type: none"> • Select 25-30 plants looping back to start • Ensure there is a mix of native and exotic plants • Where plants have separate sexes, identify these and ensure both are included 	<ul style="list-style-type: none"> • GPS coordinates or plant maps if repeating previous surveys • Plant identification field guides • Herbarium staff assistance 	<ul style="list-style-type: none"> • Transect contains a mix of native and exotic plants • Where separate sexes occur, both are included in transect
2. Assign plant ID numbers and 'tag' names	<ul style="list-style-type: none"> • Tag plants with numbers using initials and numbers (1, 2, etc.) • Use pre-existing ID numbers if site has been surveyed before • Use NVS code / own 'tag name' 	<ul style="list-style-type: none"> • Blossom_visitorobservation.xls • Tagging tape • Water and fade-proof marker • Record of plant ID numbers if repeating previous surveys 	<ul style="list-style-type: none"> • All plants in transect labelled using tape • Existing ID numbers used where plants have been surveyed before
3. Collect representative plant vouchers and identify them	<ul style="list-style-type: none"> • Collect a sample (30cm) for each plant (stem, leaves, buds, blossoms, seeds and roots where whole plant is collected) • Label, press and dry voucher specimens • Arrange formal identification 	<ul style="list-style-type: none"> • Plant_vouchers.xls • Secateurs • Trowel • Labels • Plant press and paper • Herbarium access • Herbarium staff assistance 	<ul style="list-style-type: none"> • Plant vouchers contain all available structures that can be used for identification and are pressed, labelled and identified (species, genus, family)
4. Collect reference insects	<ul style="list-style-type: none"> • Use sweep net and/or kill jar with ethyl acetate to capture and knock out insect visitors • Put temporary label in plastic vials and add one insect per vial – place in freezer overnight • Collect lots of insects, esp. native bees and flies • Collect both sexes where sexual dimorphism occurs • Keep collecting until you have a representative sample 	<ul style="list-style-type: none"> • Insect_vouchers.xls • Insect sweep net • Kill jar – with plaster of Paris layer at base • Ethyl acetate (read SDS!) • Ethyl acetate SDS • Plastic vials • Temporary labels • Freezer 	<ul style="list-style-type: none"> • Reference collection is a representative sample as judged by trainer

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5. Pin and label insects	<ul style="list-style-type: none"> • Collect insects from freezer and pin one at a time • Refer to Walker & Crosby to ensure insect pinning methods are followed – look at previous collections also • Use pins to pin insects to Styrofoam and arrange legs, wings etc. – ensure temporary label is pinned with insect • Use butterfly boards for butterflies and moths • Leave insects to dry out • Print and complete labels for insects – space labels on pin using pinning block 	<ul style="list-style-type: none"> • Walker, A.K. & Crosby, T.K. 1988. <i>The preparation and curation of insects</i>. DSIR Information Series 163. Science Information Publishing Centre, DSIR, Wellington, New Zealand. 91pp • Insect pins - minuten, 0, 1, 2, 3, 4 • Plastazote • Points • Glue • Pinning blocks • Styrofoam • Fine forceps • Insect labels - on archival card • Scissors • Archival ink pen - 0.1mm nib 	<ul style="list-style-type: none"> • Insects pinned using appropriate method and with legs and wings spread as recommended in Walker & Crosby • Labels pinned through centre and spaced using pinning block
6. Identify main insect blossom visitors	<ul style="list-style-type: none"> • Arrange dry, labelled insects according to blossom visitor groups in Richard Toft's guide • If not familiar with insects, arrange insects as a 3-D key, with questions such as 'number of wings' used to separate insects into visitor groups • Go out into the field with your trainer and practice identifying insects 	<ul style="list-style-type: none"> • Richard Toft's insect guide • Walker, A. 2000. <i>The Reed Handbook of Common New Zealand Insects</i>. Reed, Auckland, New Zealand. 174 p. ISBN: 0 7900 0718 5 • Crowe, A. 2002. <i>Which New Zealand Insect?</i> Penguin Books, Auckland, New Zealand. 127 p. ISBN: 0 14 100636 6 • Parkinson, B & Patrick, B. 2000. <i>Butterflies and Moths of New Zealand</i>. Reed, Auckland, New Zealand. 60p. ISBN: 0 7900 0734 7 	<ul style="list-style-type: none"> • Can identify 20 pinned insects (chosen by trainer) into blossom visitor groups consistently • Can identify 30 insects (chosen by trainer) in blossoms and on the wing • Uses consistent 'tag' names for insects that cannot be readily identified

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7. Use a 0.75m ² quadrat	<ul style="list-style-type: none"> • Use a 0.75m² quadrat for initial transect • Use quadrat less often with practice, but check occasionally that area being surveyed still is approx. 0.75m² 	<ul style="list-style-type: none"> • 0.75m² quadrat 	<ul style="list-style-type: none"> • Can use an approximate 0.75m² area without using quadrat
8. Use 'Kestrel' weather tracker	<ul style="list-style-type: none"> • Set altitude on 'Kestrel' • Take temperature, wind speed, relative humidity and atmospheric pressure readings using 'Kestrel' 	<ul style="list-style-type: none"> • 'Kestrel' weather tracker • 'Kestrel' instruction manual 	<ul style="list-style-type: none"> • Readings for temperature, wind speed, relative humidity and atmospheric pressure similar to those taken immediately after by trainer
9. Complete a 'near-instantaneous count'	<ul style="list-style-type: none"> • Record time, sun/rain data and count main blossom visitors • Move closer and count smaller insects inside blossoms • Count birds/butterflies over the whole plant • If there are no blossom visitors present, mark this in the 'Nil blossom visitors' column • Estimate blossom numbers during the first transect of each day and record using orders of magnitude, e.g. 1, 10, 100, 1000, etc – if blossoms close during the day, note this in the 'comments' column • Wear unobtrusive, dull coloured clothes, avoid using perfume and take care so there is no interference with sun or insect flight-paths 	<ul style="list-style-type: none"> • Blossom Visitor Data Collection guide • 'Kestrel' weather tracker • Data sheets • Black pen or dark pencil 	<ul style="list-style-type: none"> • All data is recorded on data sheet • Blossom numbers similar to estimations made by trainer

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10. Take plant and flower photos, and macro-photographs of insects to record behaviour in blossom	<ul style="list-style-type: none"> For each plant on transect, take photographs of whole plant, a blossom and a macro-photo of finer blossom structure Record photo voucher data on Photo_voucher.xls Take sequences of macro-photos of insects in flowers to record insect behaviour 	<ul style="list-style-type: none"> Canon 350D digital camera Macro lens Twin flash unit Instruction manual OR see pollination website Photo_voucher.xls 	<ul style="list-style-type: none"> Voucher photos show sufficient detail to be useful Voucher data recorded on Photo_voucher.xls 1 in every 10 insect photos are in focus, show sufficient detail and are taken as a sequence of photos so we can work out what insect is doing
11. Create voucher insect collection	<ul style="list-style-type: none"> On completion of insect counts at each transect plant, or on completion of transect, collect insect visitor vouchers Pin and label insect vouchers Enter data on Insect_vouchers.xls Identify gaps in voucher collection and target these insects so you have a representative sample of visitors for each plant 	<ul style="list-style-type: none"> Insect_vouchers.xls Insect sweep net Kill jar Plastic vials Temporary labels Ethyl acetate (read SDS!) Ethyl acetate SDS Freezer Blossom_visitor_observations.xls 	<ul style="list-style-type: none"> Insect voucher data entered on data sheets Insects pinned correctly and fully labelled, including unique insect voucher ID number A representative sample of insects is collected for each plant
12. Obtain a minimum of 10-20 full days' data	<ul style="list-style-type: none"> Be out in the field every fine day until you have at least 10, preferably 20 days of data Use poor days to curate insects and enter data on spreadsheets and database Do some evening/morning insect collections – esp. moths! 	<ul style="list-style-type: none"> Datasheets for blossom observations, insect vouchers, and photo vouchers Digital camera and accessories Insect collection and mounting equipment 10-20 days fine weather – good luck! 	<ul style="list-style-type: none"> 10-20 days data is collected and entered on spreadsheets and in database